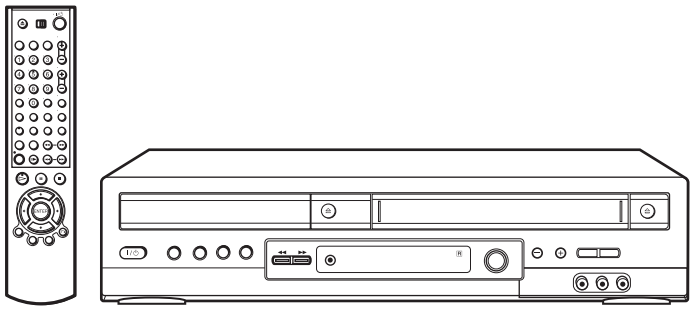
SLV-D500P

RMT-V501B

SERVICE MANUAL

US Model



TS-10 MECHANISM

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT MANUAL VII for MECHANICAL ADJUSTMENTS. (9-921-790-11)

SPECIFICATIONS

System

Laser
- Semiconductor laser

Format
- VHS NTSC standard

Video recording system
- Rotary head helical scanning FM system

Video heads
- Double azimuth four heads

Video signal
- NTSC color, EIA standards

Tape speed
- SP: 33.35 mm/s (1 3/8 inches/s)
- EP: 11.12 mm/s (7/16 inches/s)
- LP: 16.67 mm/s (11/16 inches/s), playback only

Maximum recording/playback time
- 8 hrs. in EP mode (with T-160 tape)

Rewind time
- Approx. 1 min (with T-120 tape)

Tuner section

Channel coverage
- VHF 2 to 13
- UHF 14 to 69
- CATV A-8 to A-1, A to W, W+1 to W+84

Antenna
- 75-ohm antenna terminal for VHF/UHF

Audio characteristics

Frequency response
- DVD VIDEO (PCM 96 kHz): 2 Hz to 44 kHz (±1.0 dB)/DVD VIDEO (PCM 48 kHz): 2 Hz to 22 kHz (±0.5 dB)/CD: 2 Hz to 20 kHz (±0.5 dB)

Signal-to-noise ratio (S/N ratio)
- 115 dB (LINE OUT (L/R) AUDIO jacks only)

Harmonic distortion
- 0.003 %

Dynamic range
- DVD VIDEO: 103 dB/CD: 99 dB

Wow and flutter
- Less than detected value (±0.001% W PEAK)

The signals from LINE OUT L/R (AUDIO) jacks are measured. When you play PCM sound tracks with a 96 kHz sampling frequency, the output signals from the DIGITAL OUT (OPTICAL or COAXIAL) jack are converted to 48 kHz sampling frequency.

Inputs and outputs

LINE IN 1 and LINE-2 IN
- VIDEO IN, phono jack (1 each)
- Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
- AUDIO IN, phono jacks (2 each)
- Input level: 327 mVrms
- Input impedance: more than 47 kilohms

LINE OUT
- VIDEO OUT, phono jack (1)
- Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
- AUDIO OUT, phono jacks (2)
- Standard output: 327 mVrms
- Load impedance: 47 kilohms
- Output impedance: less than 10 kilohms

DIGITAL OUT
- OPTICAL, Optical output jack
- - 18 dBm (wave length: 660 nm)
- COAXIAL, phono jack
- Output signal: 0.5 Vp-p, 75 ohms

COMPONENT VIDEO OUT (Y, Pb, Pr)
- Phono jack
- Y: 1.0 Vp-p/Pb, Pr: 0.7 Vp-p, 75 ohms

S-VIDEO OUT
- 4-pin, mini-DIN jack
- Y: 1.0 Vp-p, unbalanced, sync negative
- C: 0.286 Vp-p, load impedance 75 ohms

Timer section

Clock
- Quartz locked

Timer indication
- 12-hour cycle

Timer setting
- 8 programs (max.)

General

Power requirements
- 120 V AC, 60 Hz

Power consumption
- 28 W

Operating temperature
- 0°C to 45°C (32°F to 113°F)

Storage temperature
- -20°C to 60°C (-4°F to 140°F)

Operating humidity
- 25% to 80%

Dimensions including projecting parts and controls (w/h/d)
- Approx. 430 × 95 × 303 mm (Approx. 17 × 3.7 × 11.8 inches)

Mass
- Approx. 4.0 kg (Approx. 8.8 lbs)

Supplied accessories

Remote commander (1)
Size AA (R6) batteries (2)
75-ohm coaxial cable with F-type connectors (1)
Audio/video cord (pinplug × 3⟷ pinplug 3) (1)

Design and specifications are subject to change without notice.

DVD PLAYER/ VIDEO CASSETTE RECORDER

SONY®

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Check the B+ voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

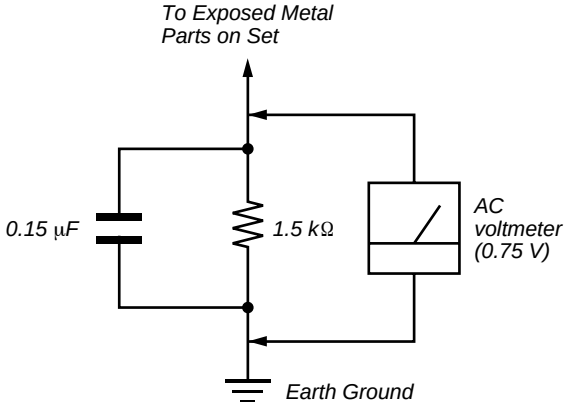


Fig. A. Using an AC voltmeter to check AC leakage.

WARNING!!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 25 cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

CAUTION:

The use of optical instrument with this product will increase eye hazard.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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PRECAUTIONS

1 SAFETY PRECAUTIONS

1) Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:

(1) Be sure that no built-in protective devices are defective or have been defeated during servicing.
(1)Protective shields are provided to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience.
(2)When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including, but not limited to, nonmetallic control knobs, insulating fish papers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning.

(2) Be sure that there are no cabinet openings through which adults or children might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, excessively wide cabinet ventilation slots, and an improperly fitted and/or incorrectly secured cabinet back cover.

(3) Leakage Current Hot Check-With the instrument completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards institute (ANSI) C101.1 Leakage Current for Appliances and Underwriters Laboratories (UL) 1270 (40.7). With the instrument's AC switch first in the ON position and then in the OFF position, measure from a known earth ground (metal water pipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle brackets, metal cabinets, screwheads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis.
Any current measured must not exceed 0.5mA. Reverse the instrument power cord plug in the outlet and repeat the test. See Fig. 1.
Any measurements not within the limits specified herein indicate a potential shock hazard that must be eliminated before returning the instrument to the customer.

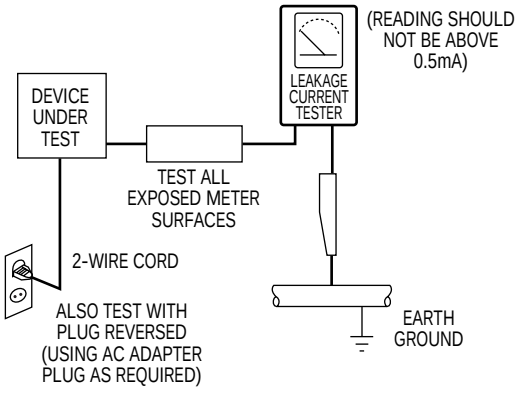

(READING SHOULD NOT BE ABOVE 0.5mA)
LEAKAGE CURRENT TESTER
DEVICE UNDER TEST
TEST ALL EXPOSED METER SURFACES
2-WIRE CORD
ALSO TEST WITH PLUG REVERSED (USING AC ADAPTER PLUG AS REQUIRED)
EARTH GROUND

Fig. 1 AC Leakage Test

(4) Insulation Resistance Test Cold Check-(1) Unplug the power supply cord and connect a jumper wire between the two prongs of the plug. (2) Turn on the power switch of the instrument. (3) Measure the resistance with an ohmmeter between the jumpered AC plug and all exposed metallic cabinet parts on the instrument, such as screwheads, antenna, control shafts, handle brackets, etc. When an exposed metallic part has a return path to the chassis, the reading should be between 1 and 5.2 megohm. When there is no return path to the chassis, the reading must be infinite. If the reading is not within the limits specified, there is the possibility of a shock hazard, and the instrument must be repared and rechecked before it is returned to the customer. See Fig. 2.

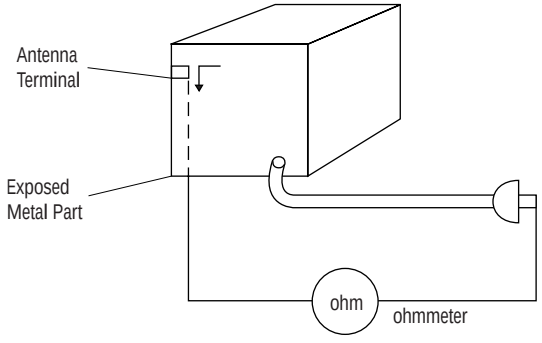


Fig. 2 Insulation Resistance Test

2) Read and comply with all caution and safety related notes on or inside the cabinet, or on the chassis.

3) Design Alteration Warning-Do not alter or add to the mechanical or electrical design of this instrument. Design alterations and additions, including but not limited to, circuit modifications and the addition of items such as auxiliary audio output connections, might alter the safety characteristics of this instrument and create a hazard to the user. Any design alterations or additions will make you, the servicer, responsible for personal injury or property damage resulting therefrom.

4) Observe original lead dress. Take extra care to assure correct lead dress in the following areas:
(1) near sharp edges, (2) near thermally hot parts (be sure that leads and components do not touch thermally hot parts), (3) the AC supply, (4) high voltage, and (5) antenna wiring. Always inspect in all areas for pinched, out-of-place, or frayed wiring, Do not change spacing between a component and the printed-circuit board. Check the AC power cord for damage.

5) Components, parts, and/or wiring that appear to have overheated or that are otherwise damaged should be replaced with components, parts and/ or wiring that meet original specifications.
Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.

6) Product Safety Notice-Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by shading, an (⚠) or a (⚠) on schematics and parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

2 SERVICING PRECAUTIONS

CAUTION: Before servicing units covered by this service manual and its supplements, read and follow the Safety Precautions section of this manual.

Note: If unforseen circument create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions. Remember: Safety First.

2-1 General Servicing Precautions

(1) a. Always unplug the instrument's AC power cord from the AC power source before (1) re-moving or reinstalling any component, circuit board, module or any other instrument assembly, (2) disconnecting any instrument electrical plug or other electrical connection, (3) connecting a test substitute in parallel with an electrolytic capacitor in the instrument.
   b. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service manual might be equipped.
   c. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
   d. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.

Note: Refer to the Safety Precautions section ground lead last.

(2) The service precautions are indicated or printed on the cabinet, chassis or components. When servicing, follow the printed or indicated service precautions and service materials.

(3) The components used in the unit have a specified flame resistance and dielectric strength.
When replacing components, use components which have the same ratings. Components identified by shading, by (⚠) or by (⚠) in the circuit diagram are important for safety or for the characteristics of the unit. Always replace them with the exact replacement components.

(4) An insulation tube or tape is sometimes used and some components are raised above the printed wiring board for safety. The internal wiring is sometimes clamped to prevent contact with heating components. Install such elements as they were.

(5) After servicing, always check that the removed screws, components, and wiring have been installed correctly and that the portion around the serviced part has not been damaged and so on. Further, check the insulation between the blades of the attachment plug and accessible conductive parts.

2-2 Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power ON. Connect the insulation resistance meter (500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (see note) should be more than 1 Megohm.

Note: Accessible conductive parts include metal panels, input terminals, earphone jacks, etc.

3 ESD PRECAUSIONS

Electrostatically Sensitive Devices (ESD)

Some semiconductor (solid state) devices can be damaged easily by static electricity.
Such components commonly are called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors and semiconductor chip components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

(1) Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

(2) After removing an electrical assembly equipped with ESD devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

(3) Use only a grounded-tip soldering iron to solder or unsolder ESD devices.

(4) Use only an anti-static solder removal devices. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ESD devices.

(5) Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESD devices.

(6) Do not remove a replacement ESD device from its protective package until immediately before your are ready to install it. (Most replacement ESD devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive materials).

(7) Immediately before removing the protective materials from the leads of a replacement ESD device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

(8) Minimize bodily motions when handling unpackaged replacement ESD devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ESD device).

4 HANDLING THE OPTICAL PICK-UP

The laser diode in the optical pick up may suffer electrostatic breakdown because of potential static electricity from clothing and your body.

The following method is recommended.

(1) Place a conductive sheet on the work bench (The black sheet used for wrapping repair parts.)

(2) Place the set on the conductive sheet so that the chassis is grounded to the sheet.

(3) Place your hands on the conductive sheet(This gives them the same ground as the sheet.)

(4) Remove the optical pick up block

(5) Perform work on top of the conductive sheet. Be careful not to let your clothes or any other static sources to touch the unit.

- Be sure to put on a wrist strap grounded to the sheet.
- Be sure to lay a conductive sheet made of copper etc. Which is grounded to the table.

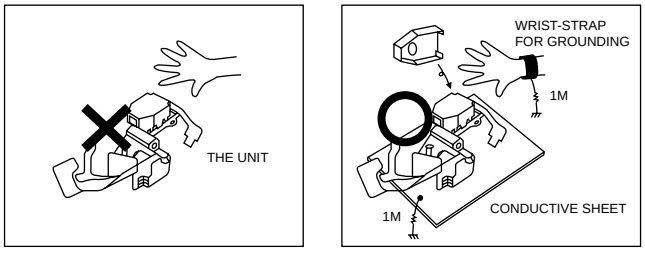


Fig.3

(6) Short the short terminal on the PCB, which is inside the Pick-Up ASS'Y, before replacing the Pick-Up. (The short terminal is shorted when the Pick-Up Ass'y is being lifted or moved.)

(7) After replacing the Pick-up, open the short terminal on the PCB.

5 PICK-UP DISASSEMBLY AND REASSEMBLY

5-1 Disassembly

1) Remove the power cord.
2) Disassemble the Deck-Assy.
3) Make solder land 2 points short on Pick-up. (See Fig. 4)
4) Disassembly the Pick-up.

5-2 Assembly

1) Replace the Pick-up.
2) Remove the soldering 2 points on Pick-up.
3) Reassemble the Deck-Assy.

Note: If the assembly and disassembly are not done in correct sequence, the Pick-up may be damaged.

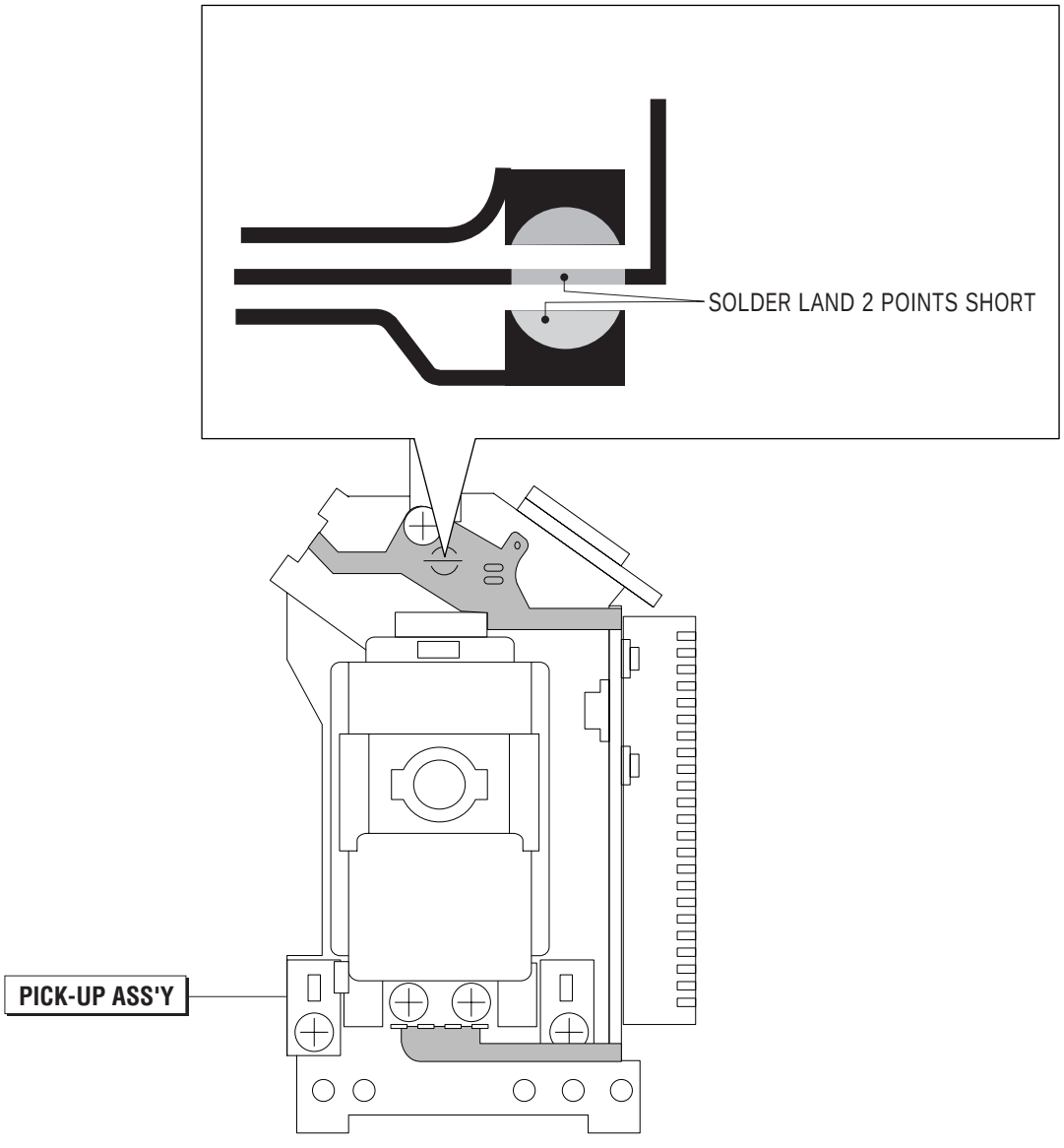


Fig. 4

MEMO

1. GENERAL

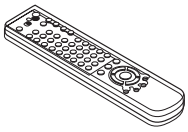
This section is extracted from instruction manual. (3-083-947-11)

Getting Started

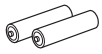
Step 1 : Unpacking

Check that you have received the following items with the DVD-VCR:

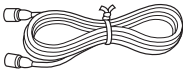
- Remote commander



- Size AA (R6) batteries



- 75-ohm coaxial cable with F-type connectors



- Audio/video cord
  (pinplug ×3 ⟷ pinplug ×3)

Controlling other TVs with the remote commander

The remote commander is preprogramed to control non-Sony TVs. If your TV is listed in the following table, set the appropriate manufacturer's code number.

1 Set TV / DVD·VIDEO at the top of the remote commander to TV.

2 Hold down **I/⏻**, and enter your TV's code number using the number buttons. Then release **I/⏻**.

Now you can use the **I/⏻**, VOL +/–, CH +/–, MUTING*, TV/VIDEO and ENTER* buttons to control your TV. You can also use the buttons marked with a dot (•) to control a Sony TV. To control the DVD-VCR, reset TV / DVD·VIDEO to DVD·VIDEO.

* for Sony TV only

Code numbers of controllable TVs

If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

TV brand	Code number
Sony	01
Akai	04
AOC	04
Centurion	12
Coronado	03
Curtis-Mathes	12
Daytron	12
Emerson	03, 04, 14
Fisher	11
General Electric	06, 10
Gold Star	03, 04, 17
Hitachi	02, 03
J.C.Penney	04, 12
JVC	09
KMC	03
Magnavox	03, 08, 12
Marantz	04, 13
MGA/Mitsubishi	04, 12, 13, 17
NEC	04, 12

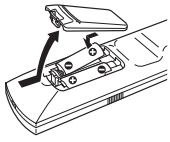
TV brand	Code number
Panasonic	06, 19
Philco	03, 04
Philips	08
Pioneer	16
Portland	03
Quasar	06, 18
Radio Shack	05, 14
RCA	04, 10
Sampo	12
Sanyo	11
Scott	12
Sears	07, 10, 11
Sharp	03, 05, 18
Sylvania	08, 12
Teknika	03, 08, 14
Toshiba	07
Wards	03, 04, 12
Yorx	12
Zenith	15

Step 2 : Setting up the remote commander

Inserting the batteries

Insert two size AA (R6) batteries by matching the + and – on the batteries to the diagram inside the battery compartment.

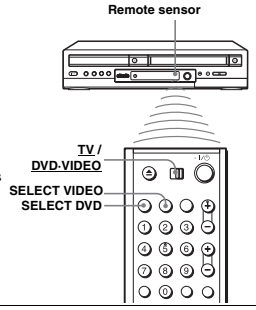
Insert the negative (–) end first, then push in and down until the positive (+) end clicks into position.



Using the remote commander

You can use this remote commander to operate this DVD-VCR and a Sony TV. Buttons on the remote commander marked with an orange dot (•) can be used to operate your Sony TV.

If the TV does not have the R symbol near the remote sensor, this remote commander will not operate the TV.



To operate	Set TV / DVD·VIDEO to
the DVD player	DVD·VIDEO, then press SELECT DVD and point at the remote sensor at the DVD-VCR
the VCR	DVD·VIDEO, then press SELECT VIDEO and point at the remote sensor at the DVD-VCR
your TV	TV and point at the remote sensor at your TV

Notes

- With normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.
- Do not leave the remote commander in an extremely hot or humid place.
- Do not drop any foreign object into the remote casing, particularly when replacing the batteries.
- Do not expose the remote sensor to direct light from the sun or lighting apparatus. Doing so may cause a malfunction.

continued

Notes

- If you enter a new code number, the code number previously entered will be erased.
- If the TV uses a different remote control system from the one programed to work with the DVD-VCR, you cannot control your TV with the remote commander.
- When you replace the batteries of the remote commander, the code number may change. Set the appropriate code number every time you replace the batteries.

Step 3 : Basic hookups

Before you get started

- Be sure to disconnect the AC power cord of each component before connecting.
- Turn off the power to all equipment.
- Do not connect the AC power cords until all of the connections are completed. If you connect the AC power cord before the connections are completed, you may not be able to use the Plug and Play function.
- Be sure you make connections firmly. Loose connections may cause picture distortion.
- If your TV does not match any of the examples provided, see your nearest Sony dealer or qualified technician.

Selecting the best hookup option

There are many ways in which your DVD-VCR can be hooked up. To hook up your DVD-VCR so that it works best for you, first scan through the table below. Then use the accompanying diagrams and procedures on the following pages to set up your DVD-VCR.

If your TV has audio/video inputs, refer to page 13 for audio/video (A/V) hookup. Then follow one of the hookups below. If your TV does not have A/V inputs, go directly to one of the hookups below.

If you have	Use	Refer to
Antenna only, no cable TV	**Hookup 1 (Plug and Play)**	**Pages 14 and 15**
No cable box or cable box with only a few scrambled channels	**Hookup 2 (Plug and Play)**	**Pages 16 and 17**
Cable box with many scrambled channels	**Hookup 3**	**Page 18**

After you have completed the connections, follow the instructions for setup.

After you have completed the setup, you are ready to use your DVD-VCR. Procedures differ depending on the hookup you used.

Caution

Connections between the DVD-VCR's VHF/UHF connector and the antenna terminals of the TV receiver should be made only as shown in the following instructions. Failure to do so may result in operation that violates the regulations of the Federal Communications Commission regarding the use and operation of RF devices. Never connect the output of the DVD-VCR to an antenna or make simultaneous (parallel) antenna and DVD-VCR connections at the antenna terminals of your receiver.

Note to CATV system installer (in USA)

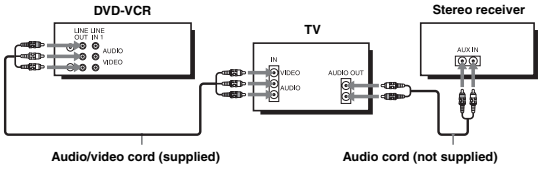
This reminder is provided to call the CATV system installer's attention to Article 820- 40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

Audio/video (A/V) hookup

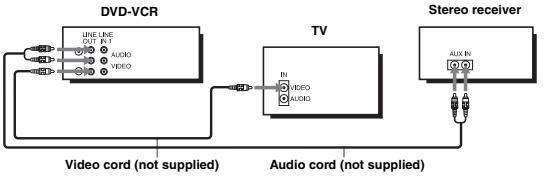
If your TV has audio/video (A/V) input jacks, you will get better picture and sound if you hook up your DVD-VCR using these connections. If your TV does not have A/V inputs, see the following pages for antenna or cable hookups. Note that "Advanced Hookups" (page 55) explains additional hookup methods that will optimize the picture and sound for a true "hometheater" experience.

If you are not planning to use your DVD-VCR to record programs, you only need to make the connections shown on this page. If you want to record regular or cable TV programs, complete these connections first, and then go to the following pages for antenna or cable hookups.

A Use this hookup if your TV has stereo jacks



B Use this hookup if your TV does not have stereo jacks



Notes

- To play a tape/disc in stereo, you must use the A/V connection.
- If you do not have a stereo receiver, connect the white LINE OUT/AUDIO L jack to the AUDIO IN jack on your TV.

continued

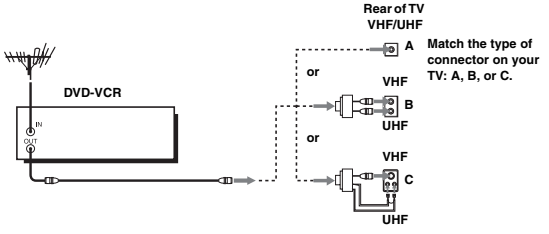
Hookup 1 (Plug and Play)

Antenna hookup

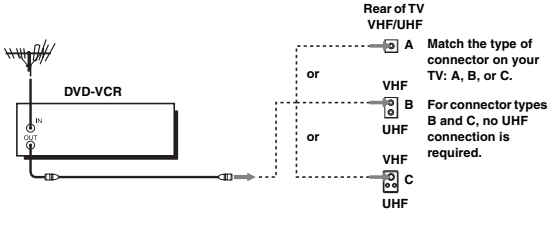
Make the following connections if you are using an antenna (if you do not have cable TV).

A Use this hookup if you are using:

- VHF/UHF antenna (you get channels 2–13 and channels 14 and higher)
- UHF-only antenna (you get channels 14 and higher)
- Separate VHF and UHF antennas



B Use this hookup if you are using a VHF-only antenna (you get channels 2–13 only)



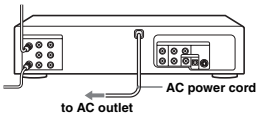
If you cannot connect your antenna cable to the DVD-VCR directly

If your antenna cable is a flat cable (300-ohm twin lead cable), attach an external antenna connector (not supplied) so you can connect the cable to the RF IN connector. If you have separate cables for VHF and UHF antennas, you should use a U/V band mixer (not supplied) (page 102).

Hookup 1 : DVD-VCR setup

Plug the DVD-VCR into an AC outlet.

The DVD-VCR automatically presets the DVD-VCR's clock and TV channels when the DVD-VCR is plugged into the AC outlet.



The DVD-VCR starts presetting the clock and channels.

When Auto preset is completed, the current time appears in the display window.

You have now completed DVD-VCR setup.

To change the on-screen display language to French or Spanish, see "Step 4 : Selecting a language" on page 19.

The clock is set using a time signal provided by some TV channels. If the clock is incorrect, or "--:--" appears in the display window, see "Using Manual Clock Set" on page 22.

To add or disable channels manually, see "Presetting/disabling channels manually" on page 26.

Notes

- If you connect the AC power cord before the antenna connections are completed, the channels may be incorrectly set. If this happens, see "Step 6 : Presetting channels" on page 24.
- Do not press any buttons on the DVD-VCR or remote commander during Auto preset.
- Auto preset starts automatically only when you plug in the AC power cord for the first time after you purchase the DVD-VCR.
- Auto preset can be performed by pressing ■ STOP on the unit continuously for 5 seconds or more with the DVD-VCR power turned off.

continued

Hookup 2 (Plug and Play)

You have no cable box, or a cable box with only a few scrambled channels

Recommended use

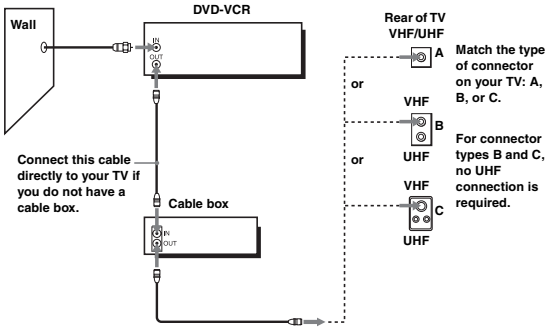
Use this hookup if you do not have a cable box. Also use this hookup if your cable system scrambles only a few channels.

What you can do with this hookup

- Record any unscrambled channel by selecting the channel on the VCR

What you cannot do

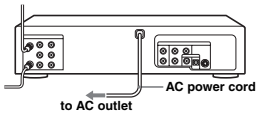
- Record scrambled channels that require a cable box



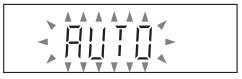
Hookup 2 : DVD-VCR setup

Plug the DVD-VCR into an AC outlet.

The DVD-VCR automatically presets the DVD-VCR's clock and TV channels when the DVD-VCR is plugged into the AC outlet.



The DVD-VCR starts presetting the clock and channels.



When Auto preset is completed, the current time appears in the display window.

You have now completed DVD-VCR setup.

To change the on-screen display language to French or Spanish, see "Step 4 : Selecting a language" on page 19.

The clock is set using a time signal provided by some TV channels. If the clock is incorrect, or "--:--" appears in the display window, see "Using Manual Clock Set" on page 22.

To add or disable channels manually, see "Presetting/disabling channels manually" on page 26.

Notes

- If you connect the AC power cord before the antenna connections are completed, the channels may be incorrectly set. If this happens, see "Step 6 : Presetting channels" on page 24.
- Do not press any buttons on the DVD-VCR or remote commander during Auto preset.
- Auto preset starts automatically only when you plug in the AC power cord for the first time after you purchase the DVD-VCR.
- Auto preset can be performed by pressing ■ STOP on the unit continuously for 5 seconds or more with the DVD-VCR power turned off.

Getting Started

continued

Hookup 3

Connecting a cable box with many scrambled channels

Recommended use

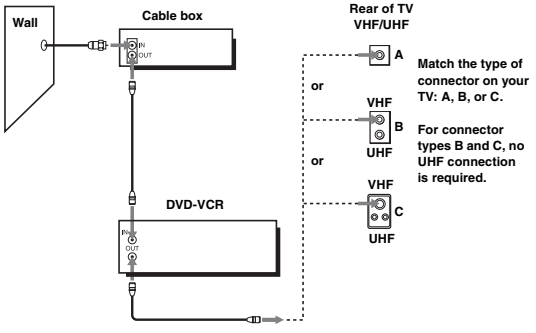
Use this hookup if your cable system scrambles all or most channels.

What you can do with this hookup

- Record any channel by selecting the channel on the cable box

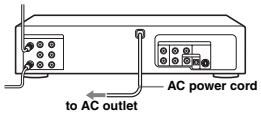
What you cannot do

- Record with the cable box turned off
- Record one channel while watching another channel



After you have completed hookup…

After you have completed hookup, plug the DVD-VCR into an AC outlet and see "Step 4 : Selecting a language" on page 19.

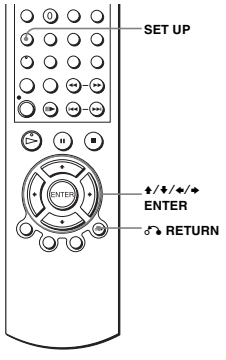


Step 4 : Selecting a language

You can change the on-screen display language.

Before you start…

- Turn on the DVD-VCR and your TV.
- To control the DVD-VCR, set TV / DVD-VIDEO to DVD-VIDEO on the remote (page 9).
- Set the "RF Output Channel" to "3CH" or "4CH" in "OPTION SETUP" menu (page 100). If your TV is connected to the DVD-VCR using A/V connections, set the TV to video input.
- If the DVD player is in play mode, you cannot display the "SETUP MENU." Stop the DVD playback.



1 SET UP

Press SET UP.

The "SETUP MENU" appears.

2 ENTER

Press ↑/↓/←/→ to select (Language/ Idioma/Langue), then press ENTER.

The "LANGUAGE/IDIOMA/LANGUE" menu appears.

3 ENTER

Press ↑/↓ to select the desired language, English, Spanish or French, then press ENTER.

4 RETURN

Press ↩ RETURN to exit the menu.

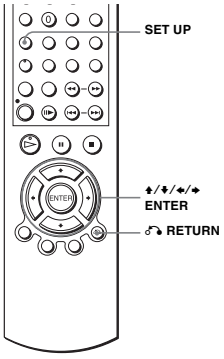
Getting Started

Step 5 : Setting the clock

Using the Auto Clock Set feature

Some TV and cable channels transmit time signals with their broadcasts. Your DVD-VCR can pick up this time signal to automatically set the clock.

The Auto Clock Set feature works only if a channel in your area is broadcasting a time signal. If broadcasters in your area are not yet sending time signals, set the time manually (page 22).



Before you start…

- Turn on the DVD-VCR and your TV. When using a cable box, turn it on.
- To control the DVD-VCR, set TV / DVD-VIDEO to DVD-VIDEO on the remote (page 9).
- Set the "RF Output Channel" to "3CH" or "4CH" in "OPTION SETUP" menu (page 100). If your TV is connected to the DVD-VCR using A/V connections, set the TV to video input.
- If the DVD player is in play mode, you cannot display the "SETUP MENU." Stop the DVD playback.

1 SET UP

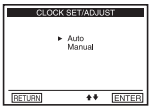
Press SET UP.

The "SETUP MENU" appears.

2

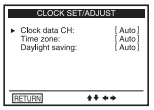
Press ↑/↓/←/→ to select (Clock Set/Adjust), then press ENTER.

The "CLOCK SET/ADJUST" menu appears.



3

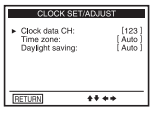
Press ↑/↓ to select "Auto", then press ENTER.



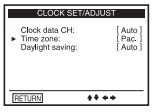
4

Press ↑/↓ to select the item you want. Then press ←/→ to make the setting.

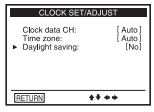
- For "Clock data CH"
  Leave the setting to "Auto" to have the DVD-VCR automatically search for a channel that carries a time signal. Press ←/→ to select a channel that carries a time signal. Use this option if you know of a channel that carries a time signal. Most PBS member stations broadcast a time signal. For the fastest response, select your local PBS station.



- For "Time zone"
  Select the time zone of your area, or select "Auto" to have the DVD-VCR automatically set your time zone.
  The options are:
  Auto ⟷ Atl. (Atlantic) ⟷ East (Eastern) ⟷ Cen. (Central) ⟷ Mtn. (Mountain) ⟷ Pac. (Pacific) ⟷ Alas (Alaska) ⟷ Haw. (Hawaii) ⟷ Auto



- For "Daylight saving"
  Select "Yes" or "No" (standard time), or "Auto" to have the DVD-VCR automatically set the daylight saving time.



5 RETURN

Press ↩ RETURN repeatedly to exit the menu.

6

To activate the Auto Clock Set function, turn off the DVD-VCR.

continued

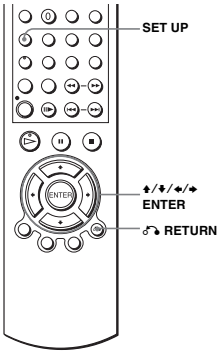
Notes

- The clock cannot be set automatically if you do not receive a channel that carries a time signal in your area. If so, set the clock manually (page 22).
- If there are only a few channels in your area that carry time signals, setting the clock automatically may take up to about 20 minutes. If nothing happens even after you wait about 20 minutes, set the clock manually (page 22).
- If you made Hookup 3, make sure you leave the cable box on.
- To record TV programs using the timer, you must set the clock accurately.
- The clock display appears when VIDEO mode is selected with no tape inserted or when the DVD-VCR is turned off.

Using Manual Clock Set

Before you start…

- Turn on the DVD-VCR and your TV.
- To control the DVD-VCR, set TV / DVD-VIDEO to DVD-VIDEO on the remote (page 9).
- Set the "RF Output Channel" to "3CH" or "4CH" in "OPTION SETUP" menu (page 100). If your TV is connected to the DVD-VCR using A/V connections, set the TV to video input.
- If the DVD player is in play mode, you cannot display the "SETUP MENU." Stop the DVD playback.



1 SET UP

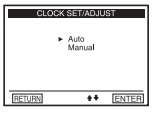
Press SET UP.

The "SETUP MENU" appears.

2

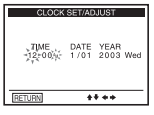
Press ↑/↓/←/→ to select (Clock Set/Adjust), then press ENTER.

The "CLOCK SET/ADJUST" menu appears.



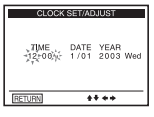
3

Press ↑/↓ to select "Manual," then press ENTER.



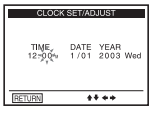
4

Press ↑/↓ to set the hour.



5

Press → to select the minutes and press ↑/↓ to set the minutes.



6

Set the month, day, and year in the same way as the minutes.

The day of the week is set automatically.

7 RETURN

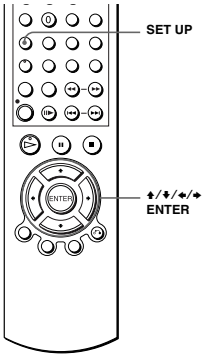
Press ↩ RETURN to save the clock setting.

Notes

- To record TV programs using the timer, you must set the clock accurately.
- The clock display appears when VIDEO mode is selected with no tape inserted or when the DVD-VCR is turned off.

Step 6 : Presetting channels

This DVD-VCR is capable of receiving VHF channels 2 to 13, UHF channels 14 to 69 and unscrambled CATV channels 1 to 125. First, we recommend that you preset the receivable channels in your area using automatic presetting methods. Then, if there are any unwanted channels, disable them manually. If you have already decided which channels you wish to preset, set them directly using manual presetting methods (page 26).



Presetting all receivable channels automatically

Before you start…

- Turn on the DVD-VCR and your TV. When using a cable box, turn it on.
- To control the DVD-VCR, set TV / DVD-VIDEO to DVD-VIDEO on the remote (page 9).
- Set the "RF Output Channel" to "3CH" or "4CH" in "OPTION SETUP" menu (page 100). If your TV is connected to the DVD-VCR using A/V connections, set the TV to video input.
- If the DVD player is in play mode, you cannot display the "SETUP MENU." Stop the DVD playback.

1 SET UP

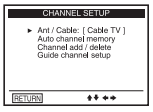
Press SET UP.

The "SETUP MENU" appears.

2

Press ↑/↓/←/→ to select (Channel Setup), then press ENTER.

The "CHANNEL SETUP" menu appears.

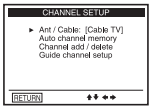


3

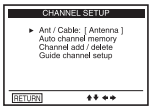
Press ↑/↓ to select "Ant/Cable."

4

- To preset cable TV channels:
  Press ←/→ to select "Cable TV."



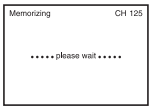
- To preset VHF and UHF channels:
  Press ←/→ to select "Antenna."



5

Press ↑/↓ to select "Auto channel memory," then press ENTER.

All receivable channels are preset in numerical sequence. When no more receivable channels can be found, presetting stops and the picture from the lowest numbered channel is displayed on the TV screen.

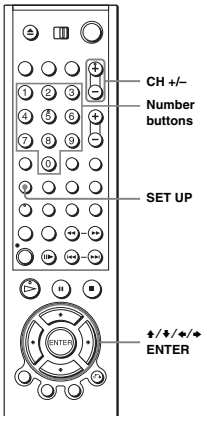


continued

Presetting/disabling channels manually

Before you start…

- Turn on the DVD-VCR and your TV. When using a cable box, turn it on.
- To control the DVD-VCR, set TV / DVD-VIDEO to DVD-VIDEO on the remote (page 9).
- Set the "RF Output Channel" to "3CH" or "4CH" in "OPTION SETUP" menu (page 100). If your TV is connected to the DVD-VCR using A/V connections, set the TV to video input.
- If the DVD player is in play mode, you cannot display the "SETUP MENU." Stop the DVD playback.



1 SET UP

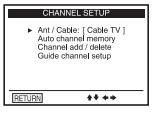
Press SET UP.

The "SETUP MENU" appears.

2

Press ↑/↓/←/→ to select (Channel Setup) then press ENTER.

The "CHANNEL SETUP" menu appears.



3

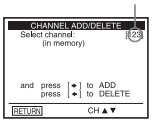
Press ↑/↓ to select "Channel add/delete," then press ENTER.

4 • CH/ TRACKING

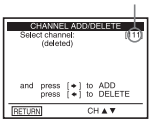
To preset/disable a channel:

1. Press CH +/– or number buttons to enter the channel number.
2. Press ←/→ to select ADD (in memory) or DELETE (deleted).
3. Press ENTER.

Channel to be preset



Channel to be disabled



5 RETURN

Press ↩ RETURN repeatedly to exit the menu.

Step 7 : Setting up the VCR Plus+® system

VHS

How the VCR Plus+ system works

Whenever you want to record a TV program, all you need to do is look up the "PlusCode" number, a number assigned to each program published in the TV section of most newspapers, cable TV listings, and even TV GUIDE magazine. Then, just enter the PlusCode number of the program you want and the VCR is automatically programed to record that show. It's that simple.

How to set up your VCR

Setting up your VCR involves coordinating the TV channel number (the number you turn to on your TV or VCR to watch a program) with the guide channel (the number that is assigned to that channel in your program guide).

To find the guide channel numbers, look at the "Channel Line-up Chart" in the program guide for your area that features VCR PlusCode numbers. It usually looks like the example to the right.

To set the guide channels, use the Channel Line-up Chart to check that the guide channel numbers match the TV channel your VCR receives. For example, if HBO is listed in the Channel Line-up Chart as channel 33, and your VCR receives HBO on channel 5, you need to coordinate these numbers using the following procedure. If the guide and TV channel numbers are the same, you can skip this procedure.

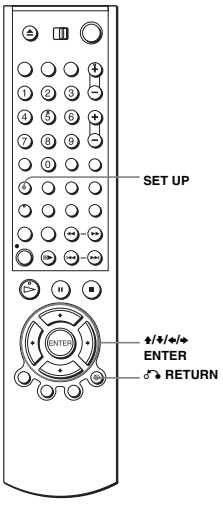
Example of "PlusCode"

PlusCode

5:30 1 MOVIE —Musical (2hrs.) 33044
2 SPORT —Golf (1hr. 25min.) 42060
CNN —WS 9974
6:30 2 3 4 DRAMA —Comedy (2hrs.) 17390
5 SCIENCE AND TECHNOLOGY
(1hr. 15min.) 73457

Example of "Channel Line-up Chart"

CABLE CH	CABLE TV	VCR Plus+ GUIDE CH
16	AMC American Movie Classics	35
17	BRV Bravo (program grid only)	54
20	CNN Cable News Network	42
21	CSP C-SPAN	28
22	DIS The Disney Channel	53
25	DSC The Discovery Channel	37
34	ESN ESPN	34
35	FAM The Family Channel	47
5	HBO Home Box Office	33
27	LIF Lifetime	46
29	MAX Cinemax	45
30	MTV Music Television	48
31	NIK Nickelodeon	38
38	SC Sports Channel	59
39	SCA Sports Channel America	70
45	SHO Showtime	41
17	TBS TBS SuperStation	43
44	TMC The Movie Channel	58
49	TNN The Nashville Network	49
50	TNT Turner Network Television	52
51	USA USA Network	44

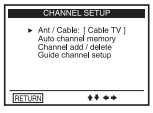


1 SET UP

Press SET UP.
The "SETUP MENU" appears.

2

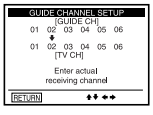
Press ↑/↓/←/→ to select (Channel Setup), then press ENTER.
The "CHANNEL SETUP" menu appears.



continued

3

Press ↑/↓ to select "Guide channel setup," then press ENTER.



4

The upper row shows VCR Plus+ guide channels and the lower row shows TV channels or cable box out put channels. Press ←/→ to select the channel number that does not match the guide channel.

5

- If you made Hookup 1 (page 14) or 2 (page 16): Enter the actual number on your TV (and VCR), then press ↑/↓.
- If you made Hookup 3 (page 18): Enter the cable box output channel (usually 2, 3, or 4), then press ↑/↓.

6

Repeat steps 4 and 5 for each channel number that does not match.

7

RETURN

Press RETURN to confirm the setting.

8

RETURN

Press RETURN repeatedly to exit the menu.

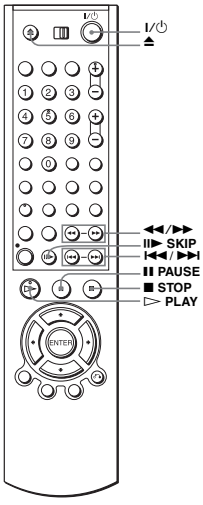
Basic Operations

Playing discs DVD VCD CD DATA-CD

Depending on the disc, some operations may be different or restricted. Refer to the operating instructions supplied with your disc.

Before you start ...

- Turn on the DVD-VCR and your TV.
- Switch the input selector on your TV so that the signal from the player appears on the TV screen.
- Set TV / DVD·VIDEO to DVD·VIDEO, then press SELECT DVD to control the DVD player (page 9).



1

Press ⏏ to open the disc tray and place a disc on the disc tray.

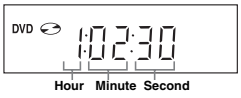
with the playback side facing down

continued

2 PLAY

Press ▷ PLAY.

The disc tray closes and the DVD player starts playback. The display window shows the playback time*. Depending on the disc, a menu may appear on the TV screen. For DVDs, see page 70. For VIDEO CDs, see page 90.



* "– – – – –" appears when no disc is loaded.

Additional tasks

To	Press
Stop play	■ STOP
Pause play*	❚❚ PAUSE
Resume play after pause	▷ PLAY
Advance by frame in pause mode	❚❚► SKIP
Go to the next chapter, track, or scene in continuous play mode	►►❙ on the remote
Go back to the previous chapter, track, or scene in continuous play mode	❙◄◄ on the remote
Stop play and remove the disc	⏏

* If you pause the DVD player for more than 5 minutes, the DVD player will automatically stop.

To Resume playback for the current disc (Resume Play)

The DVD player remembers the point where you stopped the disc even if the DVD player enters standby mode by pressing I/⏻.

1 While playing a disc, press ■ STOP to stop playback.

2 Press ▷ PLAY.

The DVD player starts playback from the point where you stopped the disc in Step 1.

To locate a point quickly by playing a disc in fast forward or fast reverse in continuous play mode (DVD, VIDEO CD and CD only)

Press ◄◄ or ►►.

For DVD or Video CD, each time you press the button, the playback speed changes as follows.
× 2 → × 4 → × 8 → × 16 → × 32 → × 128 (DVD only)
Release the button at the desired speed.

For CD, the searching speed does not change (× 8 play).

When you find the point you want, press ▷ PLAY.

To watch slow motion in continuous play mode (DVD and VIDEO CD only)

Press ❚❚ PAUSE, then press ►► SLOW ❙►. With each press, the playback speed changes cyclically as follows.

→ 1/8 → 1/4 → 1/2 →

To resume normal playback, press ▷ PLAY.

Notes

- You can change the screen type using the "SCREEN SETUP" menu. (See "Screen Setup" on page 62)
- Do not perform VIDEO playback while playing back a disc.
- If you play a DVD or VIDEO CD that has scratches, the player may stop playback at the point of the scratch.
- You cannot change the MP3 or the Multi Session CD playback speed.
- VIDEO CD fast forward/reverse and slow motion play cannot be paused.
- When playing a chapter with multi-angles on a DVD in slow motion, you cannot change the slow motion playback speed (1/2 only).
- During CD fast forward/reverse play, no sound is output.
- The PROGRESSIVE button is not available when the DVD player is in play mode. Use the PROGRESSIVE button in stop mode.

Notes on playing DTS* sound tracks on a CD

- When playing DTS-encoded CDs, excessive noise will be heard from the analog stereo jacks. To avoid possible damage to the audio system, the consumer should take proper precautions when the analog stereo jacks of the DVD player are connected to an amplification system. To enjoy DTS Digital Surround™ playback, an external 5.1-channel decoder system must be connected to the digital jack of the DVD player.
- Set the sound to "STEREO" using the AUDIO button when you play DTS sound tracks on a CD (page 80).
- Do not play DTS sound tracks without first connecting the DVD player to an audio component having a built-in DTS decoder. The DVD player outputs the DTS signal via the DIGITAL AUDIO OUT (COAXIAL or OPTICAL) jack even if "DTS" is set to "Off" in "AUDIO SETUP" menu (page 60), and may affect your ears or cause your speakers to be damaged.

Notes on playing DVDs with a DTS sound track

- DTS audio signals are output only through the DIGITAL AUDIO OUT (COAXIAL or OPTICAL) jack.
- When you play a DVD with DTS sound tracks, set "DTS" to "On" in "AUDIO SETUP" menu (page 60).
- If you connect the player to audio equipment without a DTS decoder, do not set "DTS" to "On" in "AUDIO SETUP" menu (page 60). A loud noise may come out from the speakers, affecting your ears or causing the speakers to be damaged.

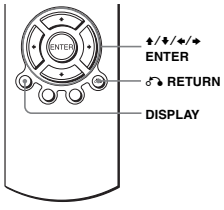
* "DTS" and "DTS Digital Out" are trademarks of Digital Theater Systems, Inc.

Guide to the on-screen display

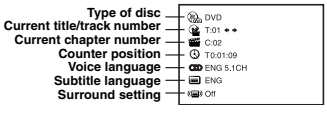
DVD VCD CD DATA-CD

You can check disc information during playback.

The displayed contents differ according to the type of disc being played.



Press DISPLAY. The following information appears; type of disc, current title/track, chapter, counter position, voice language, subtitle language and surround setting. Refer to "DVD Audio/Subtitle Language" on page 117 for the abbreviation of the language.



You can playback the desired title/track, chapter or counter position using this menu.

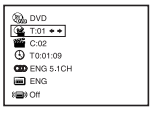
To playback the desired title/track or chapter

1 Press ↑/↓ to select the desired item.

2 Press ←/→ to change the item.

3 Press ENTER to start playback.

4 Press DISPLAY or RETURN to turn off the menu.



The title/track or chapter icon will appear on the DVD playback screen followed by the current title/track or chapter number and the counter positon.

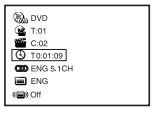
To playback from the desired counter position

1 Press ↑/↓ to select the counter position icon.

2 Enter the desired position using the number buttons.

3 Press ENTER to start playback.

4 Press DISPLAY or RETURN to turn off the menu.



Tip

- You can change the counter position information (playing time or remaining time) using ←/→ (DVD and CD only).

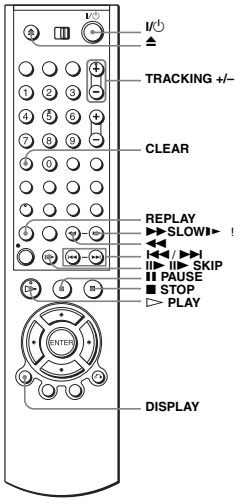
Notes

- The display may not change as operated depending on the disc.
- The display window continue indicating the playing time even when the counter position information on the on-screen display is being changed.

Playing a tape VHS

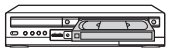
Before you start ...

- Turn on the DVD-VCR and your TV.
- Switch the input selector on your TV so that the signal from the player appears on the TV screen.
- Set TV / DVD-VIDEO to DVD-VIDEO, then press SELECT VIDEO to control the VCR (page 9).



1 Insert a tape.

The VCR starts playing automatically if you insert a tape with its safety tab removed.

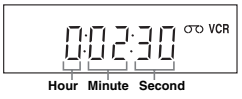


2 PLAY

Press ▷ PLAY.

The display window shows the playback time.

When the tape reaches the end, it will rewind automatically.



Additional tasks

To	Press
Stop play	■ STOP
Pause play*	II PAUSE
Resume play after pause	II PAUSE or ▷ PLAY
Fast-forward the tape	▶▶ during stop
Rewind the tape	◀◀ during stop
Eject the tape	⏏

* If you pause the VCR for more than 5 minutes, the VCR will automatically resume play.

To play a recently watched scene

You can immediately rewind and playback the scene you want to watch again.

During playback, press REPLAY. The VCR rewinds the tape about 10 seconds in the SP mode (about 15 seconds in the EP mode) on the counter for each press of the button, and restarts playback.

To skip playback

You can skip a scene that you do not want to watch (such as a commercial) and restart playback.

During playback, press II► II► SKIP. The VCR skips the tape 30 seconds on the counter each time the button is pressed (up to four times) and playback is resumed.

To turn off the power while rewinding (Rewind Shut Off)

Press I/⏻ while the tape is rewinding. The power will turn off but the tape will keep rewinding until it reaches the end.

To play/search at various speeds

Playback options	Operation
View the picture during fast-forward or rewind	During fast-forward, hold down ▶▶. During rewind, hold down ◀◀.
Play at high speed	• During playback, briefly press ▶▶ or ◀◀. The tape continues to play at 5 times normal speed. • During playback, hold down ▶▶ or ◀◀. The tape continues to play at 5 times normal speed. When you release the button, normal playback resumes.

continued

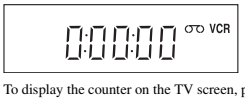
Playback options	Operation
Play in slow motion	During pause, press ▶▶SLOW ▮►.
Play frame by frame	During pause, press II► II► SKIP.
Play at various speeds (Shuttle play)	During playback, press I◀◀ or ▶▶I SHUTTLE. You can change the playback speed as follows. –×7 ↔ –×5 ↔ –×3 ↔ STILL ↔ SLOW ↔ PLAY ↔ ×2 ↔ ×3 ↔ ×5 ↔ ×7

To resume normal playback

Press ▷ PLAY.

To use the time counter

Press CLEAR at the point on the tape that you want to find later. The counter in the display window resets to "0:00:00." To search for the counter 0:00:00 point automatically, see "To search for the counter 0:00:00 point" on page 95.



To display the counter on the TV screen, press DISPLAY during normal playback.

Tip

- Adjust the picture using the TRACKING +/– buttons if:
  – Streaks appear while playing in slow motion.
  – The picture shakes during pause.

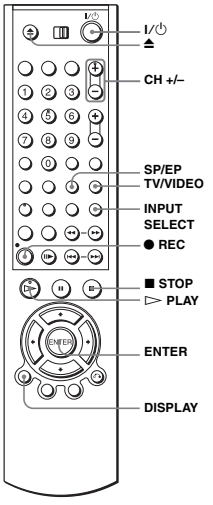
Notes

- Tapes recorded in the LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- The counter resets to "0:00:00" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.
- When 10 hours have passed, the counter in the display window returns to "0:00:00" and the count starts over again.
- The sound is muted during playback at various speeds.
- The picture may show noise when playing at high speed in reverse.
- While playing a tape, you can display the "SETUP MENU" but the remote commander's function switches to DVD automatically. Press ↩ RETURN repeatedly to exit the menu.
- When playback does not start even if you insert a tape with its safety tab removed, set "Auto Play" to "On" in the "VIDEO FUNCTION SETUP" menu (page 97).
- Stop disc playback while playing back a video.
- The VCR can also play S-VHS tapes. The VCR will automatically identify the type of tape inserted in the VCR (either VHS or S-VHS). When S-VHS tapes are played in the VCR, the enhanced resolution will not be visible on screen; there may also be picture distortion while playing the S-VHS tape in slow motion or while utilizing other special playback modes. The VCR will not record in S-VHS mode on an S-VHS tape.

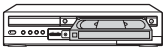
Recording TV programs VHS

Before you start ...

- Turn on the DVD-VCR and your TV.
- Switch the input selector on your TV so that the signal from the player appears on the TV screen.
- Set TV / DVD-VIDEO to DVD-VIDEO, then press SELECT VIDEO to control the VCR (page 9).
- To record from a cable box, turn it on.
- Make sure the tape is longer than the total recording time.

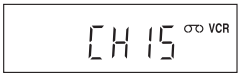


1 Insert a tape with its safety tab in place.



2 • CH/TRACKING +/–

Press CH +/– to select the channel or line input video source you want to record.



continued

3 SP / EP

Press SP/EP to select the tape speed, SP or EP.

EP (Extended Play) provides recording time three times as long as SP (Standard Play). However, SP produces better picture and audio quality.

4 ●REC

Press ● REC to start recording.

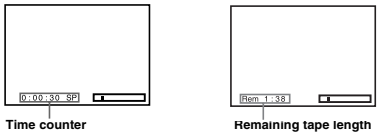
"REC" appears in the display window.

To stop recording

Press ■ STOP.

To check the remaining tape length

Press DISPLAY to display the time counter. With the display on, press DISPLAY again to check the remaining time. The white bar indicates the current location in relation to the entire tape length. The remaining time also appears. Press DISPLAY to turn off the indicators.



To check the remaining tape length of a tape, set "Tape Length" in the "VIDEO FUNCTION SETUP" menu correctly (page 97).

Maximum Recording Time

Tape Length	SP	EP
T-120	2 hrs	6 hrs
T-160	2 hrs 40 mins	8 hrs
T-180	3 hrs	9 hrs

To watch another TV program while recording

1 Press TV/VIDEO to display "TV" in the display window.

2 If your TV is connected to the VCR using A/V connections, set the TV to the TV's antenna input; if not, skip this step.

3 Select another channel on the TV.

To watch a DVD while recording

1 Press SELECT DVD to control the DVD player.

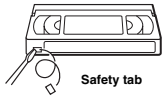
2 Press ⏏ and place the disc on the disc tray.

3 Press ▷ PLAY.

The disc tray closes and the DVD player starts playback. The TV screen will automatically change to the DVD playback screen.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on the tape again, cover the tab hole with adhesive tape.



Tips

- To select a channel, you can use the number buttons on the remote commander. Enter the channel number, then press ENTER.
- You can select a video source from the LINE IN 1 or LINE-2 IN jacks using the INPUT SELECT button.
- The display appears on the TV screen indicating information about the tape, but the information will not be recorded on the tape.
- If you do not want to watch TV while recording, you can turn off the TV. When using a cable box, make sure to leave it on.

Notes

- The remaining tape length may not be indicated accurately for short tapes such as T-20 or T-30, or tapes recorded in the LP mode.
- It may take up to one minute for the VCR to calculate and display the remaining tape length after you press DISPLAY.
- You cannot record a DVD to a VCR tape.
- To watch a TV program during video recording, stop disc playback.

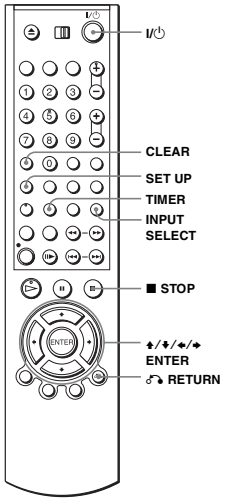
Recording TV programs using the timer

VHS

You can preset up to eight programs at a time.

Before you start...

- Check that the DVD-VCR clock is set to the correct time.
- Turn on the DVD-VCR and your TV.
- Switch the input selector on your TV so that the signal from the player appears on the TV screen.
- Set TV / DVD-VIDEO to DVD-VIDEO, then press SELECT VIDEO to control the VCR (page 9).
- When using a cable box, turn it on.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- If the DVD player is in play mode, you cannot display the "SETUP MENU." Stop the DVD playback.



1 SET UP / SUBTITLE/TIMER

Press SET UP.

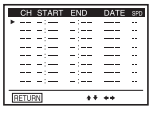
The "SETUP MENU" appears.

You can also use the TIMER button in VIDEO mode, then you can skip step 2.

2 ENTER

Press ↑/↓/←/→ to select (Set Timer Recording), then press ENTER.

The program menu appears.



3 ENTER

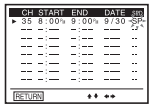
If necessary, press ↑/↓ to select the row that is to be set.

4 ENTER

Set the channel number, start and stop time, date, and tape speed:

1 Press → to flash each item in turn.

2 Press ↑/↓ to set each item.



To correct a setting, press ← to return to that setting and reset.

INPUT SELECT

To record from a source connected to the LINE IN 1 or LINE-2 IN jacks, press INPUT SELECT or ↑/↓ to display "L1 " or "L2" in the "CH" position.

To record the same program every day or the same day every week, press ↓ while the date is flashing. For details, see "Daily/weekly recording" on page 44.

To use the Auto Tape Speed function, press ↓ to display "AUTO" in the "SPD" position. For details, see "To use the Auto Tape Speed function" on page 44.

5 RETURN / CLEAR

Press ↩ RETURN to confirm the setting.

The ⏲ indicator appears in the display window.

To enter another setting, press ↑/↓ to select the next row and repeat step 4.

Press CLEAR repeatedly to cancel the setting.

6 RETURN

Press ↩ RETURN repeatedly to exit the menu.

The DVD-VCR stands by for recording (timer recording will operate properly regardless if the DVD-VCR power is on or off). When using a cable box, leave it on.

continued

To stop recording

To stop the DVD-VCR while recording, press SELECT VIDEO and then press ■ STOP.

Daily/weekly recording

In step 4 above, press ↓ to select the recording pattern. Each time you press ↓, the indication changes as shown below. Press ↑ to change the indication in reverse order.

MO~FR → SUN'S → MON'S → ..... → SAT'S → 1 month later → (dates count down) → the current date

To use the Auto Tape Speed function

When you are recording a program in the AUTO mode and the remaining tape becomes shorter than the recording time, the tape speed is automatically changed to the EP mode. Note that some noise will appear on the picture when the tape speed is changed. If you want to keep the tape speed, select SP. To operate this function, set "Tape Length" in "VIDEO FUNCTION SETUP" menu correctly (page 97).

To watch another TV program after setting the timer

1 Press TV/VIDEO to display "TV" in the display window.

2 If your TV is connected to the VCR using A/V connections, set the TV to the TV's antenna input; if not, skip this step.

3 Select another channel on the TV.

To watch a DVD after setting the timer

1 Press SELECT DVD to control the DVD player.

2 Press ⏏ and place the disc on the disc tray.

3 Press ▷ PLAY.

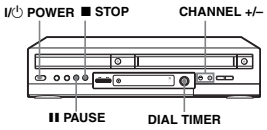
The disc tray closes and the DVD player starts playback. The TV screen will automatically change to the DVD playback screen.

Tips

- To set the channel, you can also use ↑/↓.
- If the ⏱ indicator appears, the timer settings overlap. To check, change or cancel the program setting, repeat the steps of "Recording TV programs using the timer" on page 42.
- If the ○ indicator appears, this means that the VCR is currently recording this program.
- You can also do the following tasks while the VCR is recording:
  – Reset the counter (page 38).
  – Display tape information on the TV screen (page 40).

Recording TV programs using the Dial Timer VHS

The Dial Timer function allows you to make timer recordings of programs without turning on your TV. Set the recording timer to record up to eight programs that will be broadcast within a month using the DIAL TIMER. The recording start time and recording stop time can be set at one minute intervals.



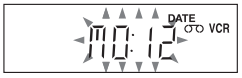
Before you start….

- Turn on the DVD-VCR.
- When using a cable box, turn it on.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.

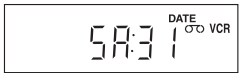
1 DIAL TIMER Press DIAL TIMER.

DATE indicator appears and the current date flashes in the display window.

If the date and time are not set, MONTH indicator will appear. To set the date and time, see "To set the clock" on page 48.



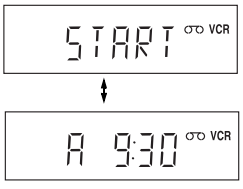
2 DIAL TIMER Turn DIAL TIMER to set the recording date.



continued

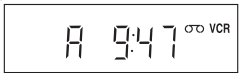
3 DIAL TIMER Press DIAL TIMER to set the start time.

"START" and the next quarter hour increment appear alternately in the display window.



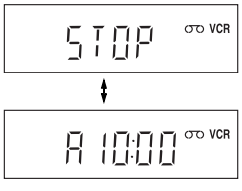
4 DIAL TIMER CHANNEL Turn DIAL TIMER to set the recording start time.

You can set the recording start time in 15 minute intervals or adjust the time in one minute intervals by pressing the CHANNEL +/– buttons on the unit.



5 DIAL TIMER Press DIAL TIMER to set the stop time.

"STOP" and the next quarter hour increment appear alternately in the display window.



6 DIAL TIMER CHANNEL Turn DIAL TIMER to set the recording stop time.

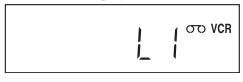
You can set the recording stop time in 15 minute intervals or adjust the time in one minute intervals by pressing the CHANNEL +/– buttons on the unit.

7 DIAL TIMER Press DIAL TIMER.

"Current channel" flashes in the display window.

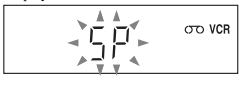
8 DIAL TIMER INPUT SELECT Turn DIAL TIMER to set the channel number.

To record from a source connected to the LINE IN 1 or LINE-2 IN jacks, turn DIAL TIMER or press INPUT SELECT to display "L1" or "L2."



9 DIAL TIMER Press DIAL TIMER.

"Current tape speed" flashes in the display window.



10 DIAL TIMER Turn DIAL TIMER to set the tape speed.

11 DIAL TIMER Press DIAL TIMER to complete the setting.

"OK" appears in the display window for about five seconds.
The timer indicator appears in the display window and the VCR stands by for recording. When using a cable box, leave it on.

To return to the previous step

To return to the previous step, press the CHANNEL + and – buttons on the unit at the same time during any of the Dial Timer settings.

continued

To set the clock

1 Hold down DIAL TIMER so that MONTH indicator appears in the display window. However, if the clock has already been set, the current setting appears.
2 Turn DIAL TIMER to set the month.
3 Press DIAL TIMER.
DAY indicator appears in the display window.
4 Turn and press DIAL TIMER to set the day and then the year.
After you set the year, "AM" and "12:– –" appear alternately in the display window.
5 Turn and press DIAL TIMER to set the hour and minute.
6 When you have finished setting the time, press DIAL TIMER to start the clock.

Tips

- To cancel a Dial Timer setting, press any button other than DIAL TIMER or CHANNEL +/– on the unit or any button on the remote while you are making the setting.
- To check, change, or cancel the program setting, see "Checking/changing/canceling timer settings" on page 53.

Notes

- If eight programs have already been set using the VCR Plus+ system or the manual timer setting, "FULL" appears in the display window for about five seconds.
- If you set the clock using the Auto Clock Set feature, the clock will adjust itself to the incoming time signal regardless of adjustments made with the Dial Timer. Be sure you have set Auto Clock Set correctly.
- If you are setting the clock for the first time or "0:– –" appears in the display window, you cannot set the clock to February 29th using the Dial Timer. Please use the Auto Clock Set feature to set the VCR to this day.
- The timer indicator flashes in the display window when you complete the setting in step 9 on page 47 with no tape inserted.
- When the setting time is incorrect, "Error" appears in the display window in step 9. Set the timer again from step 1.

About the Demonstration Mode

The Dial Timer function has a Demonstration Mode that allows the user, such as a salesperson, to enter more than eight examples of timer settings when demonstrating the use of the Dial Timer. It cancels the FULL notice which appears if eight programs have already been set. Do not use the Demonstration Mode for making timer recordings. Doing so may cause the settings to be inaccurate.

To activate the Demonstration Mode

Press ❚❚ PAUSE on the unit while turning the DIAL TIMER. "DEMO" appears in the display window for a few seconds.

To cancel the Demonstration Mode

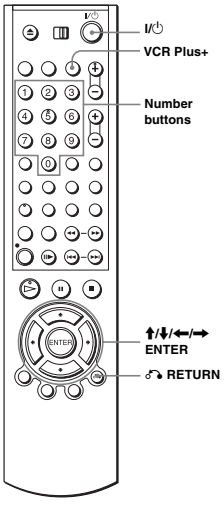
Turn the power off and unplug the AC power cord. Although the Demonstration Mode is canceled, the timer settings entered while using the Demonstration Mode will remain. Be sure to manually cancel the timer settings before you use the Dial Timer or any other timer method after reconnecting the AC power cord (page 53).

Recording TV programs using the VCR Plus+® system VHS

Just enter the PlusCode number listed in the TV program guide. The date, time and channel number of that program are set automatically. You can preset up to eight programs together with the DIAL TIMER and manual timer settings at one time.

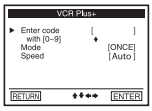
Before you start…

- Check that the DVD-VCR clock is set to the correct time.
- Turn on the DVD-VCR and your TV.
- Switch the input selector on your TV so that the signal from the player appears on the TV screen.
- Set TV / DVD-VIDEO to DVD-VIDEO, then press SELECT VIDEO to control the VCR (page 9).
- When using a cable box, turn it on.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- If the DVD player is in play mode, you cannot display the "SETUP MENU." Stop the DVD playback.



1 VCR Plus+

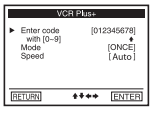
Press the VCR Plus+ button.



2 Press ↑/↓ to select "Enter code."

3 Press the number buttons to enter the PlusCode number.

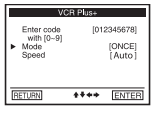
To correct a setting, press ← to return to that setting and reset.



4 Press ↑/↓ to select "Mode."

5 Press ←/→ to select ONCE, MO~FR, or Weekly:

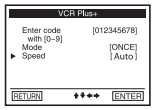
To record	Select
Only once	ONCE
Everyday Monday to Friday	MO~FR
Once a week	Weekly



6 Press ↑/↓ to select "Speed."

continued

7 Press ←/→ to select the tape speed, Auto, SP, or EP.



8 Press ENTER to confirm the setting.

To enter another setting, repeat steps 1 to 7.

9 Press ↩ RETURN to exit the menu.

RETURN

10 Press I/⏻ to turn off the VCR.

The timer indicator appears in the display window and the VCR stands by for recording. When using a cable box, leave it on.

To stop recording

To stop the VCR while recording, press ■ STOP.

To use the DVD-VCR after setting the timer

To use the DVD-VCR before a timer recording begins, just press I/⏻. The timer indicator disappears from the display window and the DVD-VCR switches on. Remember to press I/⏻ to reset the VCR to the timer recording standby mode after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter (page 38).
- Display tape information on the TV screen (page 40).
- Check the timer settings (page 53).
- Watch another TV program (page 41).

Tip

- To check, change or cancel the program setting, see "Checking/changing/canceling timer settings" on page 53.

Note

- If the VCR does not accept the PlusCode number, this means that:
  – The PlusCode number is incorrect.
  – ONCE, MO~FR, or Weekly was selected incorrectly. You cannot select MO~FR or Weekly for a program that airs more than seven days ahead.
  Correctly set the PlusCode number again from step 2.
- When the PlusCode number is incorrect, "Invalid Code" will appear in the display.

2 Press ↑/↓/←/→ to select "Set Timer Recording", then press ENTER.

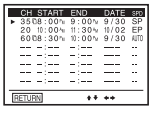
- If you want to change a setting, go on to the next step.
- If you do not need to change the settings, press ↩ RETURN repeatedly to exit the menu, then turn off the VCR to return to recording standby.

RETURN

3 Press ↑/↓ to select setting you want to change or cancel.

- To change the setting, press ←/→ to flash the item you want to change, and press ↑/↓ to change it.
- To cancel the setting, press CLEAR.

CLEAR



4 Press ↩ RETURN to confirm the setting.

RETURN

The ⊖ indicator appears in the display window.

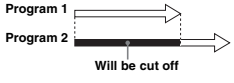
5 Press ↩ RETURN repeatedly to exit the menu.

RETURN

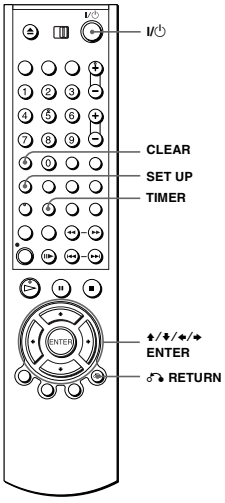
The DVD-VCR stands by for recording (you do not have to turn off the DVD-VCR). When using a cable box, leave it on.

When the timer settings overlap

The program that starts first has priority and the second program starts recording only after the first program has finished. If the programs start at the same time, the program listed first in the menu has priority.



Checking/changing/canceling timer settings VHS



1 Press SET UP when the DVD player is in stop mode.

SET UP

SUBTITLE/ TIMER

The "SETUP MENU" appears.

You can also use the TIMER button in VIDEO mode, then you can skip step 2.

continued

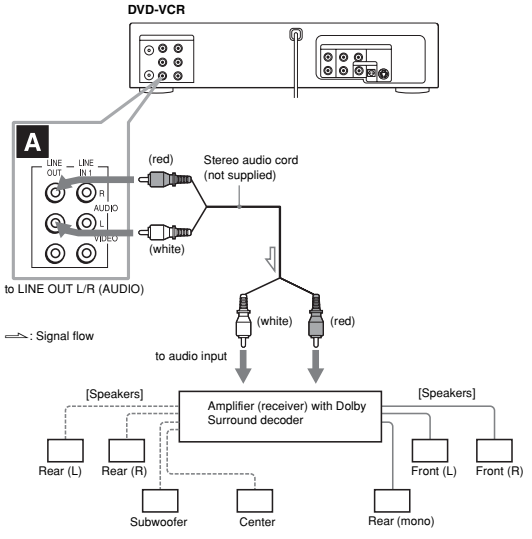
Advanced Hookups

A/V Receiver hookup DVD VCD CD DATA-CD VHS

A Use this hookup if your A/V receiver has a Dolby* Surround (Pro Logic) decoder and 3 to 6 speakers

You can enjoy the Dolby Surround effects only when playing Dolby Surround audio or multi-channel audio (Dolby Digital) discs.

* Manufactured under license from Dolby Laboratories. "Dolby," "Pro Logic," and the double-D symbol are trademarks of Dolby Laboratories.



Note

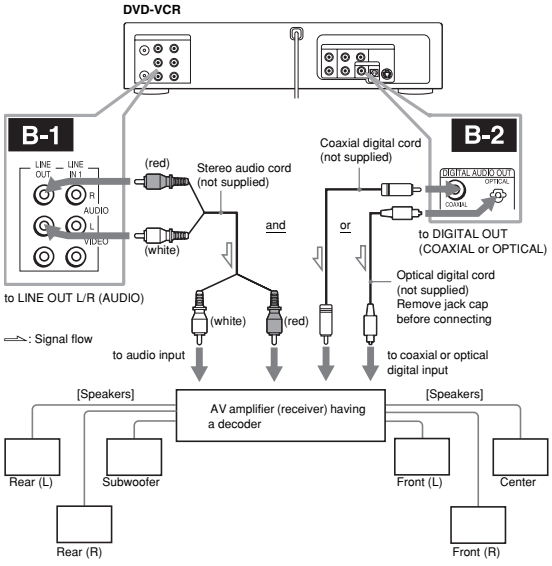
- When connecting 6 speakers, replace the monaural rear speaker with a center speaker, 2 rear speakers and a subwoofer.

continued

B Use this hookup if your A/V reciever has a Dolby Digital or DTS* decoder, a digital input jack and 6 speakers

This connection will allow you to use the Dolby Digital or DTS decoder function of your AV amplifier (receiver). You are not able to enjoy the surround sound effects of this player. You must make connections using **B-1** and **B-2**.

* "DTS" and "DTS Digital Out" are trademarks of Digital Theater Systems, Inc.



Note

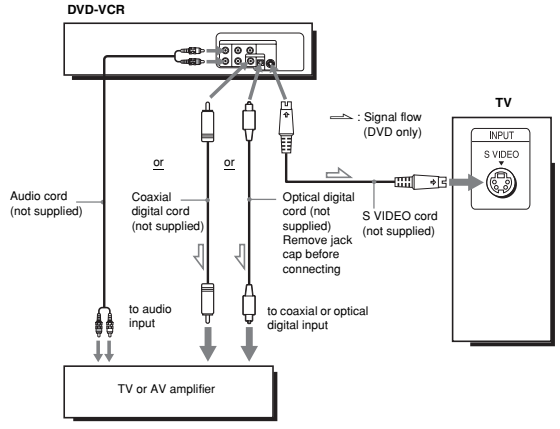
- After you have completed the connection, be sure to set "Dolby Digital" to "Dolby Digital" and "DTS" to "On" in "AUDIO SETUP" menu (page 60). Otherwise, no sound or a loud noise will come from the speakers.

S-Video/Component Video hookup DVD VCD

Make audio connections using the LINE OUT AUDIO L/R jacks or DIGITAL AUDIO OUT (OPTICAL or COAXIAL) jacks on the right side of the DVD-VCR when you use S-VIDEO/ Component Video hookup.

A Use this hookup if your TV has an S VIDEO input jack

Connect an S VIDEO cord (not supplied). You will enjoy high quality images.



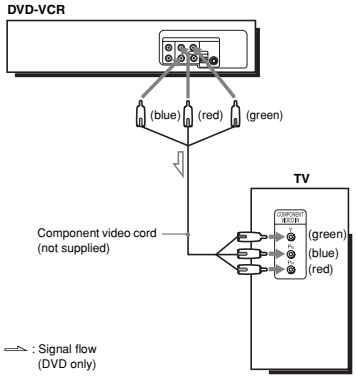
Notes

- Set "Video Out" to "S-Video" in the "SCREEN SETUP" menu (page 64) to view pictures from the S VIDEO jack.
- The connection using S VIDEO OUT jack is only for the DVD player.

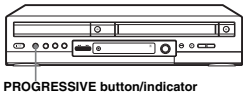
continued

B Use this hookup if your TV has component video input jacks

Connect your TV via the COMPONENT VIDEO OUT jacks using a component video cord (not supplied) or three video cords (not supplied) of the same kind and length. You will enjoy accurate color reproduction and high quality images.
See page 55 for audio connections.



If your TV accepts progressive (480p) format signals, you must use this connection and then press the PROGRESSIVE button on the front panel when the DVD player is in stop mode to accept progressive video signals. The PROGRESSIVE indicator lights up in blue when the DVD player outputs progressive signals.



PROGRESSIVE button/indicator

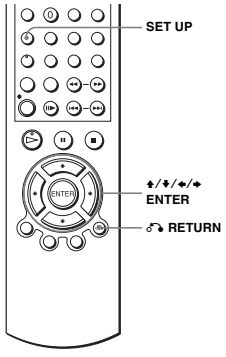
Notes

- Set "Video Out" to "Component" in the "SCREEN SETUP" menu (page 64) to view pictures from the component video jacks.
- The connection using COMPONENT VIDEO OUT jack is only for the DVD player.
- The PROGRESSIVE button is not available when the DVD player is in play mode. Use the PROGRESSIVE button in stop mode.

DVD Settings and Adjustments

Audio Setup DVD

"Audio Setup" allows you to set the sound according to the playback and connection conditions.



1 SET UP

Press SET UP when the DVD player is in stop mode.

The "SETUP MENU" appears.

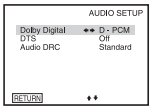
2 ENTER

Press ↑/↓/←/→ to select (DVD Setup), then press ENTER.

The "DVD SETUP" menu appears.

3 ENTER

Press ↑/↓ to select "Audio Setup," then press ENTER.



continued

4 Press ↑/↓ to select the setup item from the displayed list: "Dolby Digital," "DTS," or "Audio DRC."

5 Press ←/→ to select an item, then press RETURN to confirm the setting.

RETURN

6 Press RETURN repeatedly to exit the menu.

RETURN

Menu choices

• Dolby Digital (DVD only)

Selects the type of Dolby Digital signal.
The default setting is indicated in bold print.

D-PCM	Select this when the player is connected to an audio component lacking a built-in Dolby Digital decoder.
Dolby Digital	Select this when the player is connected to an audio component with a built-in Dolby Digital decoder.

• DTS (DVD only)

Selects whether or not to output DTS signals.
The default setting is indicated in bold print.

Off	Select this when the player is connected to an audio component lacking a built-in DTS decoder.
On	Select this when the player is connected to an audio component with a built-in DTS decoder.

• Audio DRC (Dynamic Range Control) (DVD only)

Makes the sound clear when the volume is turned down when playing a DVD that conforms to "Audio DRC." This affects the output from the following jacks:
– LINE OUT AUDIO L/R jacks
– DIGITAL AUDIO OUT (OPTICAL or COAXIAL) jack only when "Dolby Digital" is set to "D-PCM".
The default setting is indicated in bold print.

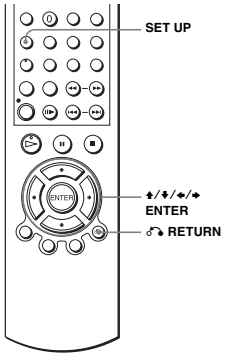
Standard	Normally select this position.
TV Mode	Makes the low sounds clear even if you turn the volume down.

Notes

- If you select surround setting while playing a DVD, the player does not output Dolby Digital signals from the DIGITAL AUDIO OUT (OPTICAL or COAXIAL) jack (when you set "Dolby Digital" to "D-PCM").
- If you connect a component that does not conform to the selected audio signal, a loud noise (or no sound) will come out from the speakers, affecting your ears or causing the speakers to be damaged.

Screen Setup DVD

"Screen Setup" allows you to set the screen according to the playback and connection conditions.



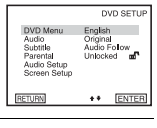
1 SET UP

Press SET UP when the DVD player is in stop mode.

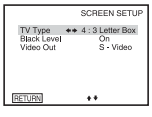
The "SETUP MENU" appears.

2 Press ↑/↓/←/→ to select (DVD Setup), then press ENTER.

The "DVD SETUP" menu appears.



3 Press ↑/↓ to select "Screen Setup," then press ENTER.



4 Press ↑/↓ to select the setup item from the displayed list: "TV Type," "Black Level," or "Video Out."

5 Press ←/→ to select an item, then press RETURN to confirm the setting.

RETURN

6 Press RETURN repeatedly to exit the menu.

RETURN

Menu choices

• TV Type (DVD only)

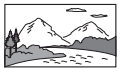
Selects the aspect ratio of the connected TV (4:3 standard or wide).
The default setting is indicated in bold print.

4:3 Letter Box	Select this when you connect a 4:3 screen TV. Displays a wide picture with bands on the upper and lower portions of the screen.
4:3 Pan Scan	Select this when you connect a 4:3 screen TV. Automatically displays the wide picture on the entire screen and cuts off the portions that do not fit.
16:9	Select this when you connect a wide-screen TV or a TV with a wide mode function.

4:3 Letter Box

4:3 Pan Scan

16:9



• Black Level

You can enhance the black level by increasing the brightness and contrast when viewing DVDs with the PROGRESSIVE indicator turned off.
The default setting is indicated in bold print.

On	Increases the contrast.
Off	Stops the increase of the contrast.

continued

• Video Out

You must set this setting when you use S VIDEO OUT or COMPONENT VIDEO OUT jacks to connect to the TV.
The default setting is indicated in bold print.

S-Video	Select this when you use the S VIDEO OUT jack on the rear panel to connect to the TV.
Component	Select this when you use the COMPONENT VIDEO OUT jacks on the rear panel to connect to the TV.

Tip

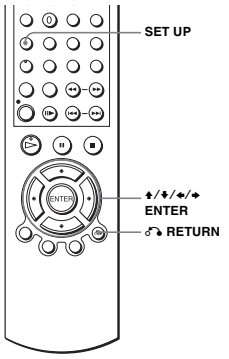
- You can select the type of signal output from the COMPONENT VIDEO OUT jacks.
  When you press the PROGRESSIVE button on the front panel when the DVD player is in stop mode, progressive signal is selected and the PROGRESSIVE indicator lights up in blue. Select this when you have a TV that can accept progressive signal.
  When you are connected to a standard (interlace format) TV, turn off the PROGRESSIVE indicator.

Notes

- Playback settings stored in the disc take priority over the "DVD SETUP" menu settings and not all the functions described may work.
- Depending on the DVD, "4:3 Letter Box" may be selected automatically instead of "4:3 Pan Scan" or vice versa.
- The connection using S VIDEO OUT or COMPONENT VIDEO OUT jacks is only for the DVD player.
- If you select progressive signal when you connect the DVD player to a TV that cannot accept the signal in progressive format, the image quality will deteriorate. In this case, press the PROGRESSIVE button to turn off the PROGRESSIVE indicator.
- You can output progressive signal only from COMPONENT VIDEO OUT jacks. If you turn on the PROGRESSIVE indicator when you set "Video Out" to "S-video", COMPONENT VIDEO OUT takes priority over S VIDEO OUT.
- The PROGRESSIVE button is not available when the DVD player is in play mode. Use the PROGRESSIVE button in stop mode.

Setting the display or sound track language DVD

You can set various languages for the disc's menu, sound track or subtitle.



1 SET UP

Press SET UP when the DVD player is in stop mode.

The "SETUP MENU" appears.

2

Press ↑/↓/←/→ to select (DVD Setup), then press ENTER.

The "DVD SETUP" menu appears.

3

Press ↑/↓ to select the language setup item from the displayed list: "DVD Menu," "Audio," or "Subtitle."
Then press ENTER.

continued

4

Press ↑/↓ to select the desired language, then press ENTER.

- DVD MENU LANGUAGE
  You can select the desired language for the disc's menu.

- AUDIO LANGUAGE
  Switches the language of the sound track. When you select "Original," the language given priority in the disc is selected.

- SUBTITLE LANGUAGE
  Switches the language of the subtitle recorded on the DVD.
  When you select "Audio Follow," the language for the subtitles changes according to the language you selected for the sound track.

5 RETURN

Press RETURN repeatedly to exit the menu.

Tip

If you select "Others" in step 4, an additional language menu appears. Press ↑/↓/←/→ to select the desired language, then press ENTER.

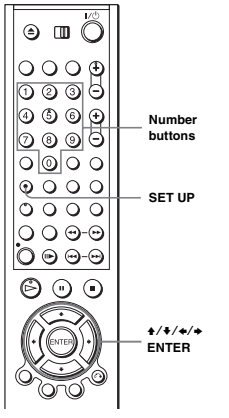
Notes

- When you select a language that is not recorded on the DVD in step 4, one of the recorded languages will be automatically selected.
- Playback settings stored in the disc take priority over the DVD SETUP settings and not all the functions described may work.

Parental Control (limiting playback by children)

DVD

Playback of some DVDs can be limited according to a predetermined level such as the age of the users. The "Parental Control" function allows you to set a playback limitation level.



1 SET UP

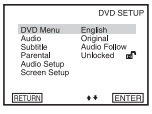
Press SET UP when the DVD player is in stop mode.

The "SETUP MENU" appears.

2

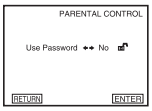
Press ↑/↓/←/→ to select (DVD Setup), then press ENTER.

The "DVD SETUP" menu appears.



continued

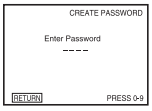
3 Press ↑/↓ to select “Parental,” then press ENTER.



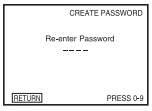
4 Press → to select “Yes”.

- If you have not entered a password

  The display for registering a new password appears.
  Enter a 4-digit password using the number buttons.

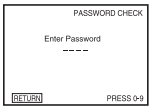


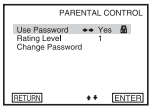
  The display for confirming the password appears.
  Re-enter the password.



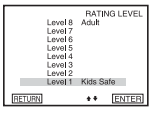
- When you have already registered a password

  The display for entering the password appears.
  Enter a 4-digit password using the number buttons.





5 Press ↑/↓ to select “Rating Level,” then press ENTER.

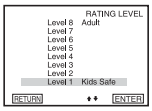


6 Press ↑/↓ to select the level you want, then press ENTER.

The options are as follows.

Level 8 (Adult) ↔ Level 7 ↔ Level 6 ↔ Level 5 ↔ Level 4 ↔ Level 3 ↔ Level 2 ↔ Level 1 (Kids Safe)

The lower the value, the stricter the limitation.



7 RETURN

Press ↩ RETURN repeatedly to exit the menu.

To change the password

1. Select “Change Password” in step 4.
   The display for entering a new password appears.
2. Enter a new 4-digit password using the number buttons.
   The display for confirming the password appears.
3. Re-enter the new password.

To turn off the Parental Control function

Set “Use Password” to “No” in Step 4.

To play a disc for which Parental Control is set

1. Insert the disc, then press ▷ PLAY.
   The display for entering your password appears.
2. Enter your 4-digit password using the number buttons.
   The player starts playback.

If you forget your password

1. Remove the disc and turn off the DVD-VCR.
2. Turn on the DVD-VCR again with no disc in the unit.
3. Hold down ◀◀ and ▶▶ on the front panel simultaneously for 5 seconds.
   “reset ok” appears on the screen.
4. Turn off the DVD-VCR.
   The password is cleared.
5. To create a new password, follow step 4 on page 68.

Notes

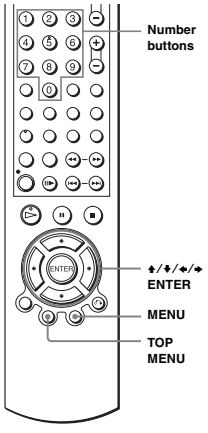
- When you play DVDs which do not have the Parental Control function, playback cannot be limited on this player.
- All the ratings higher than the level you select will be blocked.
- Write your password down and keep it in a safe place in case you forget it.

DVD Additional Operations

Using the DVD’s menu DVD

A DVD is divided into long sections of a picture or a music feature called “titles.” When you play a DVD which contains several titles, you can select the title you want using the TOP MENU button.

When you play DVDs that allow you to select items such as the language for the subtitles and the language for the sound, select these items using the MENU button.



1 TOP MENU / MENU

Press TOP MENU or MENU.

The disc’s menu appears on the TV screen.

The contents of the menu vary from disc to disc.

2 Press ↑/↓/←/→ to select the item you want to play or change.

You can also use the number buttons to select the item.

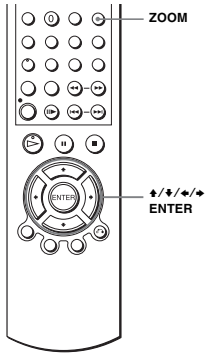
3 Press ENTER.

Note

- Depending on the DVD, you may not be able to use the TOP MENU button.

Zooming into a scene DVD VCD DATA-CD

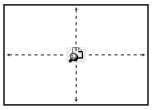
You can zoom into a scene during playback or still mode. To zoom into a JPEG image, see “Playing JPEG image files” on page 87.



1 MUTING/ZOOM

Press ZOOM.

“ 🔍 ” appears.



2 Press ↑/↓/←/→ to move “ 🔍 ” to the position where you want to zoom in.

3 Press ENTER repeatedly to change the magnification.

Each time you press the button, the magnification changes as shown below.

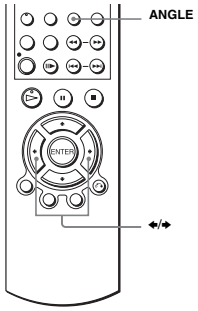
2× → 4× → 2× → normal magnification

Notes

- You cannot use 4× magnification when you play VIDEO CDs.
- The zoom function may not work depending on the DVD.

Changing the angles DVD

If various angles (multi-angles) for a scene are recorded on the DVD, "" appears in the display when you press ANGLE during playback. This means that you can change the viewing angle.

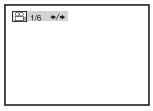


1 ANGLE

Press ANGLE during playback.

The angle number appears on the display.

The number after the slash indicates the total number of angles.



2

Press ←/→ repeatedly to select the angle number.

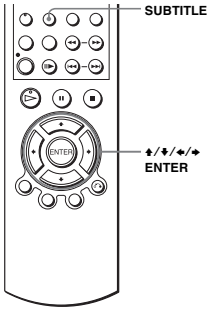
The scene changes to the selected angle.

Note

- Depending on the DVD, you may not be able to change the angles even if multi-angles are recorded on the DVD.

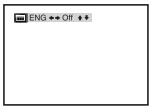
Displaying the subtitle DVD

If subtitles are recorded on the disc, you can change the subtitles or turn them on and off whenever you want while playing a DVD.



1 SUBTITLE/TIMER

Press SUBTITLE during playback.



2

Press ←/→ repeatedly to select the language.

Depending on the DVD, the choice of language varies. Refer to "DVD Audio/Subtitle Language" on page 117 for the abbreviation of the language.

3

Press ↑/↓ repeatedly to select "On."

To turn off the subtitles

Select "Off" in step 3.

Note

- Depending on the DVD, you may not be able to change the subtitles even if multilingual subtitles are recorded on it. You also may not be able to turn them off.

Various play mode functions (Program play, Shuffle play, Repeat play) DVD VCD CD DATA-CD

You can set the following play modes:

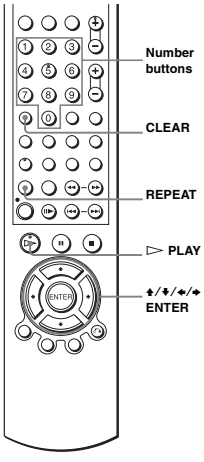
- Program play (page 74)
- Shuffle play (page 76)
- Repeat play (page 77)

Note

- The play mode is canceled when:
  - you open the disc tray
  - the player enters standby mode by pressing I/⏻.

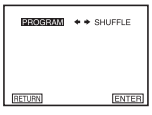
Creating your own program (Program play) CD

You can play the contents of a disc in the order you want by arranging the order of the tracks on the disc to create your own program. You can program up to 20 tracks.



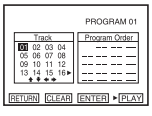
1 REPEAT/REPLAY

Press REPEAT when the DVD player is in stop mode.



2

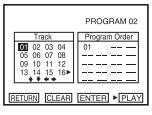
Press ←/→ to select "PROGRAM", then press ENTER.



3

Press ↑/↓/←/→ to select the track number you want to program, then press ENTER.

You can also use the number buttons to enter the track number.



4

To program other tracks, repeat step 3.

The programed track numbers are displayed in the selected order.

5 PLAY

Press ▷ PLAY to start program play.

Program play starts.

When the program ends, you can restart the same program again by pressing ▷ PLAY.

To stop program play

Press CLEAR.

To change or cancel a program

1 Follow steps 1 and 2 of "Creating your own program (Program play)."

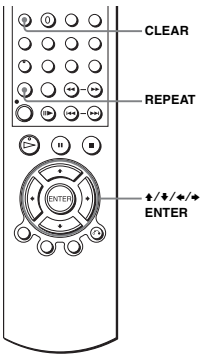
2 Press CLEAR.
The last programed number is canceled.

3 Follow step 3 for new programing.

continued

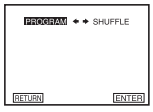
Playing in random order (Shuffle play) CD

You can shuffle the playback order of tracks. Subsequent "shuffling" may produce a different playing order.



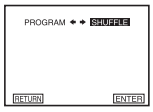
1 REPEAT/REPLAY

Press REPEAT when the DVD player is in stop mode.



2 ENTER

Press ←/→ to select "SHUFFLE", then press ENTER.

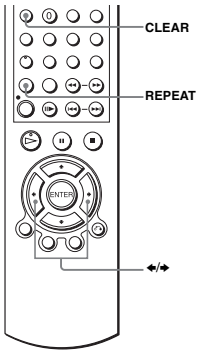


To return to normal play

Press CLEAR.

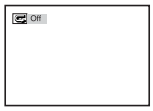
Playing repeatedly (Repeat play) DVD VCD CD DATA-CD

You can play all of the titles or tracks on a disc or a single title, chapter, or track repeatedly.



1 REPEAT/REPLAY

Press REPEAT during playback.



2 REPEAT/REPLAY, ENTER

Press REPEAT or ←/→ repeatedly to select the item to be repeated.

When playing a DVD

- Chapter: repeats the current chapter.
- Title: repeats the current title on a disc.

When playing a VIDEO CD or CD

- Track: repeats the current track.
- Disc: repeats all of the tracks.

When playing a DATA CD (MP3 audio)

- Track: repeats the current track.

To return to normal play

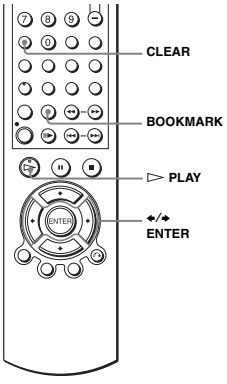
Select "Off" or press CLEAR in step 2.

Using bookmarks DVD VCD

You can store scenes in the player's memory as bookmarks.

You can set up to three bookmarks.

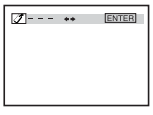
Select "MENU OFF" before setting up bookmarks on a VIDEO CD (see "Playing VIDEO CDs with "MENU ON/OFF" Functions" on page 90).



1 BOOKMARK/SEARCH MENU

Press BOOKMARK during playback.

Three bookmark placeholders (- - -) appear next to the bookmark icon.



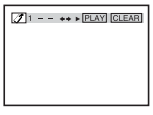
2 ENTER

Press ←/→ to select one of the placeholders.

3 ENTER

Play the DVD scene you want, then press ENTER.

The selected placeholder changes to a number (1, 2 or 3).



To cancel the bookmark

Press CLEAR after step 3.

To exit the Bookmark menu

Press BOOKMARK.

To playback the scene where you insert a bookmark

1 Press BOOKMARK during playback.

2 Press ←/→ to select the bookmark placeholder, then press ▷ PLAY to play the bookmark.

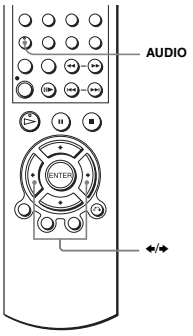
Note

- Depending on the DVD, you may not be able to use the bookmark function.

Changing the sound DVD VCD CD

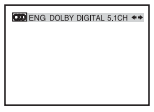
When playing a DVD recorded in multiple audio formats (PCM, Dolby Digital, or DTS), you can change the audio format. If the DVD is recorded with multilingual tracks, you can also change the language.

With CDs, DATA CDs, or VIDEO CDs, you can select the sound from the right or left channel and listen to the sound of the selected channel through both the right and left speakers. For example, when playing a disc containing a song with the vocals on the right channel and the instruments on the left channel, you can hear the instruments from both speakers by selecting the left channel.



1 AUDIO

Press AUDIO during playback.



2 ENTER

Press ←/→ repeatedly to select the desired language/audio setting.

- When playing a DVD
  Depending on the DVD, the choice of language varies.
  Refer to "DVD Audio/Subtitle Language" on page 117 for the abbreviation of the language.
- When playing a VIDEO CD or CD
  The default setting is indicated in bold print.

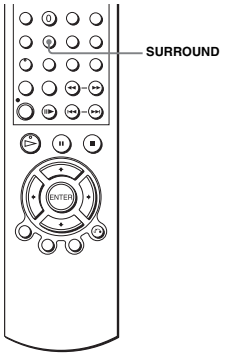
STEREO	The standard stereo sound
Left	The sound of the left channel (monaural)
Right	The sound of the right channel (monaural)

Notes

- When the playing signal does not contain a signal for the rear speakers, the surround effects will be difficult to hear.
- When you activate the surround effect, turn off the surround setting of the connected TV or amplifier (receiver).
- Make sure that your listening position is between and at an equal distance from your speakers, and that the speakers are located in similar surroundings.
- If you use the DIGITAL AUDIO OUT (OPTICAL or COAXIAL) jack and set "Dolby Digital" to "Dolby Digital" or "DTS" to "On" in "AUDIO SETUP" menu, sound will come from your speakers but it will not have the surround effect.
- Certain audio features of this product manufactured under a license from Desper Products, Inc. Spatializer®, VBX™ and the circle-in-square device are trademarks owned by Desper Products, Inc.

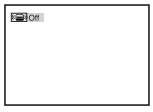
Virtual surround setting DVD

When you connect a stereo TV or 2 front speakers, SURROUND lets you enjoy surround sound effects by using sound imaging to create virtual rear speakers from the sound of the front speakers without using actual rear speakers. This function is designed to work with the LINE OUT AUDIO L/R jacks.



1 SURROUND

Press SURROUND during playback.



2 SURROUND

Press SURROUND repeatedly to select "On."

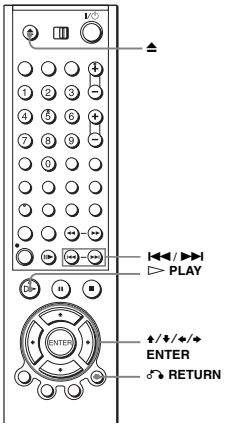
To cancel the setting

Select "Off" in step 2.

continued

Playing an MP3 audio track DATA-CD

You can play back DATA CDs (CD-ROMs/CD-Rs/CD-RWs) recorded in MP3 (MPEG1 Audio Layer 3) format.

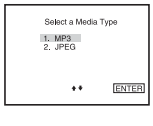


1 ⏏

Press ⏏ and place a DATA CD on the disc tray, then press ⏏ to close the tray.

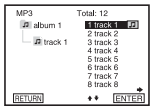
When you load a DATA CD which contains MP3 audio tracks and JPEG image files, "Select a Media Type" menu appears.

If you load a DATA CD which contains only MP3 audio files, the MP3 display appears. Then you can skip step 2.



2 ENTER

Press ↑/↓ to select "MP3", then press ENTER.



continued

3 Press ↑/↓ or I◄◄ / ►►I to select the desired track, then press ENTER.

The selected track starts playing.

When a track or album is being played, its title is shaded. The playing track number appears on the display window.

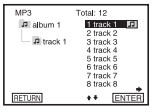
4 RETURN

To change the album, press ↶ RETURN.

5 Press ↑/↓ to select an album, then press ENTER.

The list of tracks contained in the album appears.

To select a track, repeat step 2.



To go to the next or previous page

Press → or ←.

To return to the previous display

Press ↶ RETURN.

To return to the "Select a Media Type" menu

Press ■ STOP twice, then press TOP MENU.

To turn off the display

Press ■ STOP, then press ↶ RETURN repeatedly.

Notes

- Only the letters in the alphabet and numbers can be used for album or track names. Anything else is displayed as an asterisk.
- Up to 10 alphanumeric characters can be displayed for album or track names.
- ID3 tags cannot be displayed.

About MP3 audio tracks

You can play MP3 audio tracks on CD-ROMs, CD-Rs, or CD-RWs. However, the discs must be recorded according to ISO9660 level 1, level 2, or Joliet format for the player to recognize the tracks.
You can also play discs recorded in Multi Session.
See the instructions of the CD-R/RW device or recording software (not supplied) for details on the recording format.

To play a Multi Session CD

This player can play Multi Session CDs when an MP3 audio track is located in the first session. Any subsequent MP3 audio tracks, recorded in the later sessions, can also be played back. When audio tracks and images in music CD format or video CD format are recorded in the first session, only the first session will be played back.

Notes

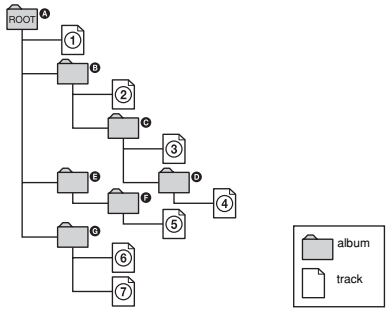
- If you put the extension ".MP3" to data not in MP3 format, the player cannot recognize the data properly and will generate a loud noise which could damage your speaker system.
- The player cannot play audio tracks in MP3PRO format.
- This player supports MP3 audio tracks recorded with a bit rate of 128 kbps and a sampling frequency of 44.1 kHz. Attempting to play MP3 audio tracks recorded with different specifications may result in loud noise, sound skipping or speaker damage.
- Depending on the disc, playback may take some time to start.

The Playback order of MP3 audio tracks

The playback order of albums and tracks recorded on a DATA CD is as follows.

- Structure of disc contents

Tree 1 Tree 2 Tree 3 Tree 4 Tree 5



continued

When you insert a DATA CD and press ▷ PLAY, the numbered tracks are played sequentially, from ① through ⑦. Any sub-albums/tracks contained within a currently selected album take priority over the next album in the same tree. (Example: C contains D so ④ is played before ⑤.)

When you press ↶ RETURN and the list of MP3 albums appears (page 84), the albums are arranged in the following order: A → B → C → D → F → G. Albums that do not contain tracks (such as album E) do not appear in the list.

Tips

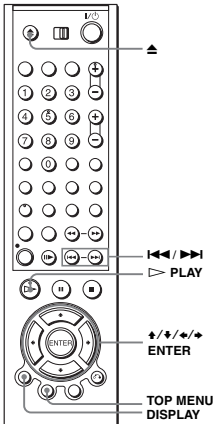
- If you add numbers (01, 02, 03, etc.) to the front of the track file names, the tracks will be played in that order.
- Since a disc with many trees takes longer to start playback, place your albums within the first two trees.

Notes

- Depending on the software you use to create the DATA CD, the playback order may differ from the illustration above.
- The playback order above may not be applicable if there are more than a total of 200 albums and tracks in the DATA CD.
- The player can recognize up to 100 albums (the player will count just albums, including albums that do not contain MP3 audio tracks). The player will not play any albums beyond the first 100 albums. Of the first 100 albums, the player will play no more than a combined total of 200 albums and tracks.

Playing JPEG image files DATA-CD

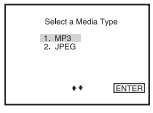
You can play JPEG image files on DATA CDs (CD-ROMs/CD-Rs/CD-RWs).



1 Press ⏏ and place a DATA CD on the disc tray, then press ⏏ to close the tray.

When you load a DATA CD which contains MP3 audio tracks and JPEG image files, "Select a Media Type" menu appears.

If you load a DATA CD which contains only JPEG image files, the ALBUM display appears. Then you can skip step 2.

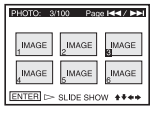


2 DISPLAY

Press ↑/↓ to select "JPEG", then press ENTER.

The ALBUM display will appears.

To display the total number of JPEG image files on the disc, press DISPLAY.



continued

3 Press I◄◄ / ►►I to select the next/previous ALBUM page, press ↑/↓/←/→ to select an image in the ALBUM display, then press ▷ PLAY.

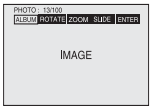
The TIMER menu appears.

4 Press ←/→ to select the desired play speed, then press ENTER.
Slide show starts from the selected image.

To display an image

1 Press ↑/↓/←/→ to select an image in the ALBUM display, then press ENTER.
The selected image number appears in the display window.

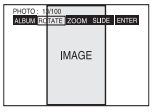
2 To display the next/previous image, press I◄◄ / ►►I.



To rotate an image

1 Press ↑/↓/←/→ to select an image in the ALBUM display, then press ENTER.

2 Press ←/→ to select ROTATE, then press ENTER.
Each time you press ENTER, the image turns clockwise by 90°.



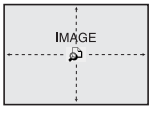
To zoom in an image

1 Press ↑/↓/←/→ to select an image in the ALBUM display, then press ENTER.

2 Press ←/→ to select ZOOM, then press ENTER.
" " appears.

3 Press ↑/↓/←/→ to move " " to the position where you want to zoom in.

4 Press ENTER repeatedly to change the magnification.
Each time you press ENTER, the magnification changes as shown below.
2× → 4× → 2× → normal magnification



To enjoy the Slide show

1 Press ↑/↓/←/→ to select an image in the ALBUM display, then press ENTER.

2 Press ←/→ to select SLIDE, then press ENTER.
The TIMER menu appears.

3 Press ←/→ to select the desired play speed, then press ENTER.
Slide show starts.

To turn on/off the menu in the single image display

Press DISPLAY in the single image display.

To turn on/off the total number of images in the ALBUM display

Press DISPLAY in the ALBUM display.

To return to the ALBUM display

Press DISPLAY to turn on the menu and press ←/→ to select ALBUM, then press ENTER. You can also use MENU button to return to the ALBUM display. Press I◄◄ repeatedly to return to the first ALBUM page.

To return to the "Select a Media Type" menu

Press ■ STOP twice, then press TOP MENU.

Notes

- Slide show can play in only one direction.
- You cannot rotate or zoom in the image during Slide show.
- If you select ALBUM in the rotated image display, the images in the ALBUM display will also be rotated. Correct the rotation in the ROTATE menu.

About JPEG image files

You can play JPEG image files on CD-ROMs, CD-Rs, or CD-RWs. However, the discs must be recorded according to ISO9660 level 1, level 2, or Joliet format for the player to recognize the files.
You can also play discs recorded in Multi Session.
See the instructions of the CD-R/RW device or recording software (not supplied) for details on the recording format.

To play a Multi Session CD

This player can play Multi Session CDs when an JPEG image file is located in the first session. Any subsequent JPEG image files, recorded in the later sessions, can also be played back. When audio tracks and images in music CD format or video CD format are recorded in the first session, only the first session will be played back.

Notes

- The system can play the extension ".JPG" or ".JPEG."
- Some CD-Rs or CD-RWs cannot be played on this system depending on file format.
- If you add the extension ".JPG" or ".JPEG" to data not in JPEG format, the display will be blank.
- Depending on the disc or the size of image files, playback may take some time to start.

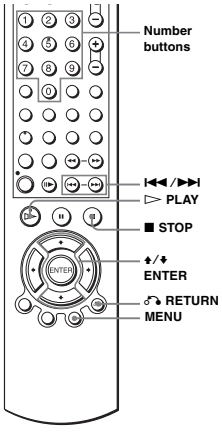
Tip

- If you add numbers (01, 02, 03, etc.) to the front of the file names, the files will be played in that order.

Playing VIDEO CDs with "MENU ON/OFF" Functions VCD

The PBC (Playback control) function allows you to search and perform other operations interactively. PBC playback follows a selection menu displayed on your TV screen.

The "MENU ON" function is the PBC function.



1 Press MENU to select "MENU ON."

The menu for your selection appears.

2 Press ↑/↓ to select the item number you want.

You can also use the number buttons to select the item number and track.

3 Press ENTER.

4 Follow the instructions in the menu for interactive operations.

Refer to the instructions supplied with the disc, as the operating procedure may differ depending on the VIDEO CD.

To return to the menu

Press ↩ RETURN.

To play using "MENU OFF"

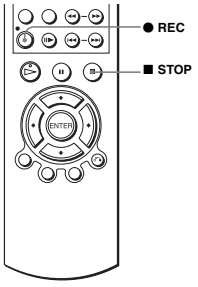
Press MENU to select "MENU OFF."
When "MENU OFF" is selected, the DVD player starts continuous play. You cannot play still pictures such as a menu.
To return to "MENU ON," press MENU to select "MENU ON."

Note

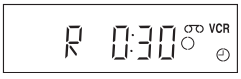
- Depending on the VIDEO CD, "Press ENTER" in step 3 may appear as "Press SELECT" in the instructions supplied with the disc. In this case, press ▷ PLAY.

Quick Timer Recording VHS

After you have started recording, you can have the VCR stop recording automatically after a specified duration.



1 While recording, press ● REC.



2 Press ● REC repeatedly to set the duration time.

Each press advances the time as follows.

0:30 → 1:00 → 1:30 → 2:00 → 2:30 → 3:00 → 3:30 → 4:00 → Normal recording

The tape counter decreases minute by minute to 0:00, then the VCR stops recording.

To extend the duration

Press ● REC repeatedly to set a new duration time.

To cancel the duration

Press ● REC repeatedly until the ⏲ indicator disappears and the VCR returns to normal recording mode.

To stop while recording

Press ■ STOP.

Note

- You cannot display the current tape time in the display window when setting the recording duration time.

Recording stereo and bilingual programs

VHS

Recording stereo programs

When you receive a program broadcast in stereo, press AUDIO to display "Hi-Fi" on the TV screen. You can also select "Left," "Right," or "Mono." If there is noise in the stereo program, select "Mono." The sound will be recorded in monaural (on both hi-fi and normal audio tracks) but with less noise.

Recording bilingual programs

Press AUDIO to display "SAP" on the TV screen. When a SAP (Second Audio Program) is received, "SAP" appears on the TV screen. When MAIN is selected, the VCR records only the main sound.

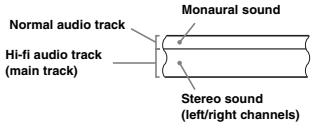
Selecting the sound during playback

During playback, press AUDIO to select the sound you want.

To listen to	On-screen display	Display window
Stereo	Hi-Fi	STEREO indicator
Left channel	Left	STEREO indicator
Right channel	Right	STEREO indicator
Monaural sound on the normal audio track	Mono	No indicator

How sound is recorded on a video tape

The VCR records sound onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.

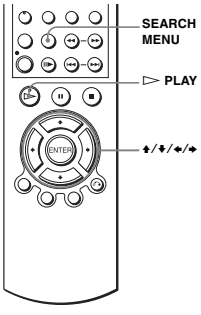


Notes

- To play a tape in stereo, you must use the A/V connections.
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO setting.

Searching using various functions VHS

The VCR automatically marks the tape with an index signal at the point where each recording begins.
You can easily find a specific point using various search functions.

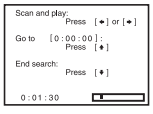


To search using the index function (Scan and Play)

The VCR automatically marks the tape with an index signal at the point where each recording begins. Use these signals as references to find a specific recording.

1 Insert an indexed tape into the VCR.

2 Press SEARCH MENU.



3 Press ◆ to scan ahead, or ◆ to scan backwards.

The VCR searches and then plays back for about five seconds.

4 Press ▷ PLAY to view that program.

If you do not press ▷ PLAY, the VCR automatically searches for the next index mark, or until it reaches the end of the tape.

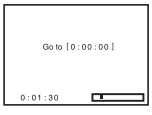
To search for the counter 0:00:00 point

To mark a point on the tape that you want to find later, reset the tape counter to "0:00:00."
The VCR automatically fast-forwards or rewinds to the 0:00:00 point on the tape counter.

1 Press SEARCH MENU.

2 Press ▲.

The VCR starts searching and automatically stops at the 0:00:00 point.



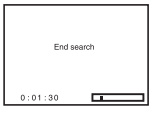
To search for a blank portion of the tape

The VCR automatically searches for the beginning of a blank portion. You can easily find a point you can start recording from.

1 Press SEARCH MENU.

2 Press ▼.

The VCR starts searching and automatically stops at the beginning of a blank space. If no blank space is found, the VCR reaches the end.



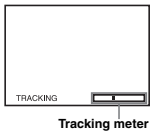
Note

- Once in recording mode, if the VCR is put in pause and then released to start the recording, no index mark will be inserted. An index mark will be inserted if the channel is changed while VCR is put in pause.

Adjusting the picture (tracking) VHS

Although the VCR automatically adjusts the tracking when playing a tape, distortion may occur if the recording is in poor condition. In this case, manually adjust the tracking.

Press TRACKING +/– to display the tracking meter. The distortion should disappear as you press one of the two tracking buttons.
To resume automatic tracking adjustment, eject the tape and reinsert it.



Tracking meter

Note

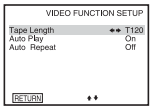
- The auto tracking adjustment cannot be guaranteed to work with tapes recorded in the LP mode on other VCRs.

Changing menu options VHS

1 Press SET UP when the DVD player is in stop mode.

2 Press ↑/↓/←/→ to select (Video Function Setup), then press ENTER.

The "VIDEO FUNCTION SETUP" menu appears.



3 Press ↑/↓ to select the option to change.

4 Press ←/→ to change the setting.

5 Press ↩ RETURN repeatedly to exit the menu.

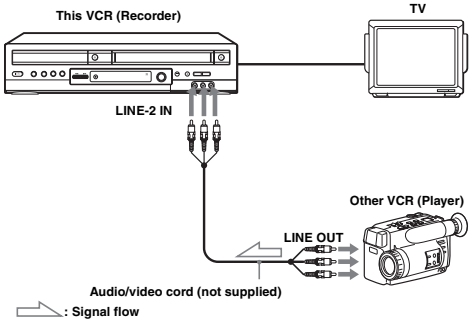
Menu choices

The default settings are indicated in bold print.

Menu option	Set this option to
Tape Length	• **T-120** when using a T-120 or shorter length tape. • T-160 when using a T-160 length tape. • T-180 when using a T-180 or longer length tape.
Auto Play	• **On** to start playback automatically, when you insert a tape with its safety tab removed. • Off to turn off Auto play. You need to press ▷ PLAY to start playback, even if you insert a tape with its safety tab removed.
Auto Repeat	• On to play back a tape repeatedly. The VCR rewinds a tape to the beginning and restarts playback automatically. • **Off** to turn off Auto repeat.

Editing with another VCR VHS

How to connect to record on this VCR



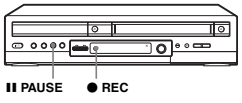
Notes

- Make sure you connect the plugs to jacks of the same color.
- If the other VCR is a monaural type and connected to this VCR's LINE-2 IN jacks, connect the audio plug to the AUDIO L (white) jack. The sound is recorded on both right and left channels. If you connect to the AUDIO R (red) jack, the sound is recorded only on the right channel.
- If you connected this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.
- You can use the LINE IN 1 jacks for editing. If the other VCR is a monaural type the sound is recorded only on the channel whose jack is connected to the audio plug. To record on both right and left channels, connect the audio plugs to the AUDIO L/R jacks using an audio/video cord (not supplied).

Operation (when recording on this VCR)

Before you start editing

- Turn on the VCR and the TV and set it to the video channel.
- Press INPUT SELECT or CH +/– to display "LINE 1" or "LINE 2" in the display window.
- Press SP/EP to select the tape speed, SP or EP.



1 Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.

2 Insert a tape into this (recording) VCR. Search for the point to start recording and press ❚❚ PAUSE.

3 Press ● REC on this VCR to set it to recording pause.

4 To start editing, press the ❚❚ PAUSE buttons on both VCRs at the same time.

To stop editing

Press the ■ STOP buttons on both VCRs.

Tip

- To cut out unwanted scenes while editing, press ❚❚ PAUSE on this VCR when an unwanted scene begins. When it ends, press ❚❚ PAUSE again to resume recording.

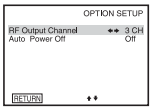
General setup information

Changing setup options

1 Press SET UP when the DVD player is in stop mode.

2 Press ↑/↓/←/→ to select (Option setup), then press ENTER.

The "OPTION SETUP" menu appears.



3 Press ↑/↓ to select the option to change.

4 Press ←/→ to change the setting.

5 Press RETURN repeatedly to exit the menu.

If you have changed the RF Output Channel, a confirmation message appears.

Press ENTER to confirm the changed channel.

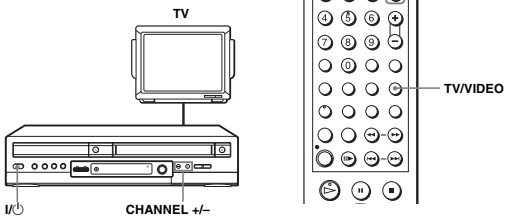
Menu choices

Initial settings are indicated in bold print.

Menu option	Set this option to
RF Output Channel	• **3CH** when using channel 3 to receive the VCR signal. • 4CH when using channel 4 to receive the VCR signal. For details, see page 101.
Auto Power Off	• 1Hr to turn off the VCR automatically one hour after the last operation. • 2Hr to turn off the VCR automatically two hours after the last operation. • **Off** to set no specific time to turn off.

Setting the RF Output channel

When connecting the DVD-VCR to the TV using only the antenna cable, you must set the RF Output channel in the "OPTION SETUP" menu so that the TV can receive the correct signal from the DVD-VCR.



1 Set the RF Output channel to "3CH" or "4CH" (see page 100 to set the channel), whichever channel is not used in your area. If both are used, set the switch to either channel.

2 Press I/⏻ to turn on the DVD-VCR.

3 Press TV/VIDEO to turn on "VCR" in the DVD-VCR's display window.

4 Press CH +/– to display a channel number in the display window.

Select an active channel number in your area.

5 Turn on your TV and set it to the channel you selected in step 1 (3CH or 4CH).

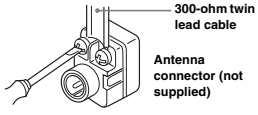
The channel you selected in step 4 appears on the TV screen. If the channels change when you press CH +/–, you have made the correct setting.

Whenever you use the DVD-VCR, set the TV to the channel selected in step 1.

continued

Attaching the external antenna connector

When using a 300-ohm twin lead cable for a VHF/UHF antenna, use an antenna connector (not supplied) to connect the antenna to the DVD-VCR.



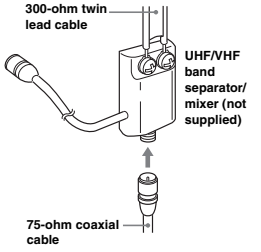
1 Loosen the screws on the antenna connector.

2 Wind the twin leads around the screws on the antenna connector.

3 Retighten the screws.

Attaching a UHF/VHF band mixer

When using both a 75-ohm coaxial cable and a 300-ohm twin lead cable for a VHF/UHF antenna, use a UHF/VHF band separator/ mixer (not supplied) to connect the antenna to the DVD-VCR.



1 Loosen the screws on the mixer.

2 Wind the twin leads around the screws on the mixer.

3 Retighten the screws.

4 Connect the 75-ohm coaxial cable to the mixer.

Troubleshooting

If you have any questions or problems not covered below, please consult your nearest Sony dealer. (For customers in USA)

General Troubleshooting

	Symptom	Remedy
Power	The I/⏻ switch does not function.	• Connect the AC power cord securely.
	The power is turned on but the DVD-VCR does not operate.	• Moisture condensation has occurred. Turn the power off, unplug the AC power cord and leave the DVD-VCR to dry for over three hours.
Clock	The clock has stopped and "--:--" appears in the display window.	• The clock stops if the DVD-VCR is disconnected from the wall outlet. Reset the clock (and timer).
Others	The remote commander does not function.	• Make sure you are pointing the remote commander at the remote sensor on the DVD-VCR. • Replace all the batteries in the remote commander with new ones if they are weak. • Make sure the TV / DVD-VIDEO switch is set correctly. • Select correctly VIDEO or DVD with the SELECT DVD/ VIDEO button.
	The tracking meter does not appear on the screen.	• The recording condition of the tape is very poor and tracking cannot be adjusted.
	You cannot control other TVs.	• Set your TV's code number. The code number may change when you replace the batteries of the remote commander.

continued

DVD Troubleshooting

	Symptom	Remedy
Picture	There is no picture/picture noise appears.	• Re-connect the connecting cord securely. • The connecting cords are damaged. • Check the connection to your TV (page 12) and switch the input selector on your TV so that the signal from the player appears on the TV screen. • The disc is dirty or flawed. • If the picture output from your player goes through your VCR to get to your TV or if you are connected to a combination TV/VIDEO player, the copy-protection signal applied to some DVD programs could affect picture quality. If you still experience problems even when you connect your player directly to your TV, please try connecting your player to your TV's S VIDEO input (page 57). • You have set the player to progressive format (the PROGRESSIVE indicator lights up in blue) eventhough your TV cannot accept the progressive signal. In this case, press the PROGRESSIVE button on the front panel until the PROGRESSIVE indicator turns off (page 64). • Even if your TV is compatible with progressive format (480p) signals, the image may be affected when you set the player to progressive format. In this case, press the PROGRESSIVE button so that the PROGRESSIVE indicator turns off and the player is set to normal (interlace) format (page 64). • COMPONENT VIDEO OUT jack is not used or "Video Out" of the "SCREEN SETUP" menu is not set correctly while the PROGRESSIVE indicator lights up in blue. Check the setting (page 64) and connection (page 57) or press the PROGRESSIVE button so that the PROGRESSIVE indicator turns off.
	Even though you set the aspect ratio in "TV Type" of the "SCREEN SETUP" menu the picture does not fill the screen.	• The aspect ratio of the disc is fixed on your DVD.
	There is no picture from your VCR connected to the LINE IN jacks.	• The DVD player must be in standby mode to view pictures from your VCR.
Sound	There is no sound.	• Re-connect the connecting cord securely. • The connecting cord is damaged. • The player is connected to the wrong input jack on the amplifier (receiver) (page 13). • The amplifier (receiver) input is not correctly set. • The player is in pause mode or in Slow-motion Play mode. • The player is in fast forward or fast reverse mode. • If the audio signal does not come through the DIGITAL AUDIO OUT (OPTICAL or COAXIAL) jack, check the audio settings (page 59).
	Sound is noisy.	• When playing a CD with DTS sound tracks, noise will come from the LINE OUT L/R (AUDIO) jacks (page 33) or DIGITAL OUT (OPTICAL or COAXIAL) jack.
	The sound volume is low.	• The sound volume is low on some DVDs. The sound volume may improve if you set "Audio DRC" to "TV Mode" (page 60).

	Symptom	Remedy
Operation	The disc does not play.	• The disc is turned over. • Insert the disc with the playback side facing down on the disc tray. • The disc is skewed. • The player cannot play certain discs (page 6). • The region code on the DVD does not match the player. • Moisture has condensed inside the player (page 3). • The player cannot play CD-Rs, CD-RWs, or DVD-Rs that are not finalized (page 7). • Make sure the TV / DVD VIDEO switch is set correctly. • Select correctly VIDEO or DVD with SELECT DVD/ VIDEO button.
	The MP3 audio track cannot be played (page 83).	• The DATA CD is not recorded in the MP3 format that conforms to ISO9660 Level 1/Level 2 or Joliet. • The MP3 audio track does not have the extension ".MP3." • The data is not formatted in MP3 even though it has the extension ".MP3." • The data is not MPEG1 Audio Layer 3 data. • The player cannot play audio tracks in MP3PRO format.
	The JPEG image file cannot be played.	• The DATA CD is not recorded in JPEG format that conforms to ISO9660 Level 1/Level 2 or Joliet. • The JPEG image file does not have the extension ".JPG" or ".JPEG." • The data is not formatted in JPEG even though it has the extension ".JPG" or "JPEG." • Length or width of the image is more than 4720 dots.
	The title of the MP3 audio album/ track or JPEG image album/file is not correctly displayed.	• The player can only display numbers and alphabet. Other characters are displayed as asterisks.
	The disc does not start playing from the beginning.	• Program play, shuffle play, or repeat play, has been selected (pages 74, 76, 77). • Resume play has taken effect (page 32).
	The player starts playing the disc automatically.	• The disc features an auto playback function.
	Playback stops automatically.	• While playing discs with an auto pause signal, the player stops playback at the auto pause signal.
	You cannot perform some functions such as stop, search, slow-motion play, repeat play, shuffle play, or program play.	• Depending on the disc, you may not be able to do some operations. See the operating manual that comes with the disc.
	The language for the sound track cannot be changed.	• Try using the DVD's menu instead of the direct selection button on the remote (page 70). • Multilingual tracks are not recorded on the DVD being played. • The DVD prohibits the changing of the language for the sound track.

continued

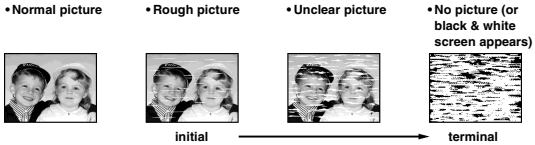
	Symptom	Remedy
Operation	The subtitle language cannot be changed or turned off.	• Try using the DVD's menu instead of the direct selection button on the remote (page 70). • Multilingual subtitles are not recorded on the DVD being played. • The DVD prohibits the changing of the subtitles.
	The angles cannot be changed.	• Try using the DVD's menu instead of the direct selection button on the remote (page 70). • Multi-angles are not recorded on the DVD being played. • The DVD prohibits changing of the angles.
	The player does not operate properly.	• When static electricity, etc., causes the player to operate abnormally, unplug the player.

VCR Troubleshooting

	Symptom	Remedy
Playback	The playback picture does not appear on the TV screen.	• Make sure the TV is set to the channel for the VCR. If you are using a monitor, set it to video input.
	The picture is not clear.	• Adjust the tracking with the TRACKING +/– buttons. • The video heads are dirty (see the last page of "Troubleshooting"). Clean the video heads using a Sony video head cleaning cassette. If a Sony cleaning cassette is not available in your area, have the heads cleaned at your nearest Sony dealer (a standard service fee will be charged). Do not use a commercially available liquid type cleaning cassette, as it may damage the video heads. • The video heads may have to be replaced. Consult your local Sony dealer for more information.
	The picture rolls vertically during picture search.	• Adjust the vertical hold control on the TV or monitor.
	The picture has no sound.	• The tape is defective. • If you made A/V connections, check the audio cord connection.
Recording	A TV program does not appear on the TV screen.	• Make sure the TV is set to the channel for the VCR. If you are using a monitor, set it to video input. • Select the correct source with the INPUT SELECT or CH +/– buttons. Select a channel number when recording TV programs; select "L1" or "L2" when recording from other equipment.
	TV reception is poor.	• Adjust the TV antenna.
	The tape starts playing as soon as it is inserted.	• The safety tab has been removed. To record on this tape, cover the tab hole.
	The tape is ejected when you press ● REC.	• Check that the safety tab has not been removed.
	Nothing happens when you press ● REC.	• Make sure the tape is not at its end.

	Symptom	Remedy
Timer recording	The timer does not operate.	• Check that the clock is set. • Make sure a tape has been inserted. • Check that the safety tab has not been removed. • Make sure the tape is not at its end. • Make sure a program has been set for timer recording. • Make sure your timer settings are past the current time. • Check that the cable box is turned on. • The clock stops if the DVD-VCR is disconnected from the wall outlet for more than one minute. Reset the clock and timer. • Turn the power off and unplug the AC power cord.
Others	A tape cannot be inserted.	• Check that a tape is not already in the tape compartment.
	The VCR mecanism needs to be cleaned.	• Clean the cabinet, panel and controls with a dry, soft cloth, or a soft cloth slightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzine.

Symptoms caused by contaminated video heads



Glossary

Chapter (page 34)

Sections of a picture or a music feature that are smaller than titles. A title is composed of several chapters. Depending on the disc, no chapters may be recorded.

Dolby Digital (pages 55 and 60)

Digital audio compression technology developed by Dolby Laboratories. This technology conforms to 5.1-channel surround sound. The rear channel is stereo and there is a discrete subwoofer channel in this format. Dolby Digital provides the same 5.1 discrete channels of high quality digital audio found in Dolby Digital cinema audio systems. Good channel separation is realized because all of the channel data are recorded discretely and little deterioration is realized because all channel data processing is digital.

Dolby Surround (Pro Logic) (page 55)

Audio signal processing technology that Dolby Laboratories developed for surround sound. When the input signal contains a surround component, the Pro Logic process outputs the front, center and rear signals. The rear channel is monaural.

DTS (page 60)

Digital audio compression technology that Digital Theater Systems, Inc. developed. This technology conforms to 5.1-channel surround sound. The rear channel is stereo and there is a discrete subwoofer channel in this format. DTS provides the same 5.1 discrete channels of high quality digital audio.
Good channel separation is realized because all of the channel data is recorded discretely and little deterioration is realized because all channel data processing is digital.

DVD (page 6)

A disc that contains up to 8 hours of moving pictures even though its diameter is the same as a CD.

The data capacity of a single-layer and single-sided DVD is 4.7 GB (Giga Byte), which is 7 times that of a CD. The data capacity of a double-layer and single-sided DVD is 8.5 GB, a single-layer and double-sided DVD is 9.4 GB, and double-layer and double-sided DVD is 17GB.
The picture data uses the MPEG 2 format, one of the worldwide standards of digital compression technology. The picture data is compressed to about 1/40 (average) of its original size. The DVD also uses a variable rate coding technology that changes the data to be allocated according to the status of the picture. Audio information is recorded in a multi-channel format, such as Dolby Digital, allowing you to enjoy a more real audio presence.
Furthermore, various advanced functions such as the multi-angle, multilingual, and Parental Control functions are provided with the DVD.

DVD-RW (page 6)

A DVD-RW is a recordable and rewritable disc that is the same size as a DVD VIDEO. The DVD-RW has two different modes: VR mode and Video mode. DVD-RWs created in Video mode have the same format as a DVD VIDEO, while discs created in VR (Video Recording) mode allow the contents to be programmed or edited.

DVD+RW (page 6)

A DVD+RW (plus RW) is a recordable and rewritable disc. DVD+RWs use a recording format that is comparable to the DVD VIDEO format.

Interlace format (page 64)

Interlace format shows every other line of an image as a single “field” and is the standard method for displaying images on television. The even number field shows the even numbered lines of an image, and the odd numbered field shows the odd numbered lines of an image.

Progressive format (pages 58 and 64)

Compared to the Interlace format that alternately shows every other line of an image (field) to create one frame, the Progressive format shows the entire image at once as a single frame. This means that while the Interlace format can show 30 frames/60 fields in one second, the Progressive format can show 60 frames in one second. The overall picture quality increases and still images, text, and horizontal lines appear sharper. This player is compatible with the 480 progressive format.

Title (page 34)

The longest section of a picture or music feature on a DVD, movie, etc., in video software, or the entire album in audio software.

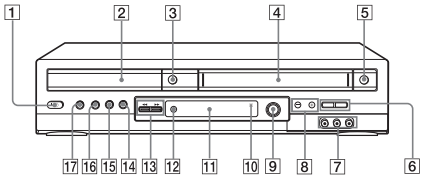
Track (page 34)

Sections of a picture or a music feature on a CD or VIDEO CD (the length of a song).

Index to parts and controls

Refer to the pages indicated in parentheses ( ) for details.

Front panel



1 I/⏻ POWER switch (10) (37)

2 Disc tray (31)

3 ⏏ (open/close) button (31) (32)

4 Tape compartment (39)

5 ⏏ (eject) button (37)

6 SELECT DVD/VIDEO (9)

7 LINE-2 IN VIDEO/AUDIO L/R jacks*1 (98)

8 CHANNEL +/– buttons*2 (39)

9 DIAL TIMER (45)

10 Remote sensor

11 Display window (32) (37)

12 ● REC (record) button (40)

13 ◀◀ (rewind)/▶▶ (fast-forward) button (32) (37)

14 ■ (stop) button (32) (37)

15 ❚❚ (pause) button (32) (37)

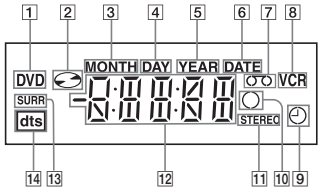
16 ▷ (play) button (32) (37)

17 PROGRESSIVE button/indicator (58) (64)

*1 Covered

*2 CHANNEL + button has a tactile dot. Use the tactile dot as a reference.

Display window



1 DVD indicator (32)

2 Disc indicator (32)

3 MONTH indicator (45)

4 DAY indicator (48)

5 YEAR indicator (48)

6 DATE indicator (45)

7 Tape indicator (37)

8 VCR indicator (37)

9 Timer indicator (43)

10 Record indicator (40)

11 STEREO indicator (93)

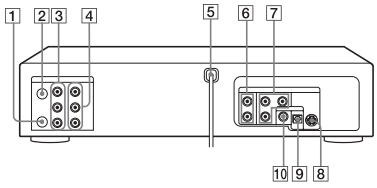
12 Playing time/clock/current status indicator (32)

13 SURR (surround) indicator (81)

14 DTS indicator (60)

continued

Rear panel



DVD player and VCR

1 RF OUT (TO TV) connector (14)

2 RF IN (FROM ANT.) connector (14)

3 LINE OUT VIDEO/AUDIO L/R jacks (13)

4 LINE IN 1 VIDEO/AUDIO L/R jacks (13)

5 AC power cord (12) (15) (17)

DVD player only

6 LINE OUT AUDIO L/R jacks (57)

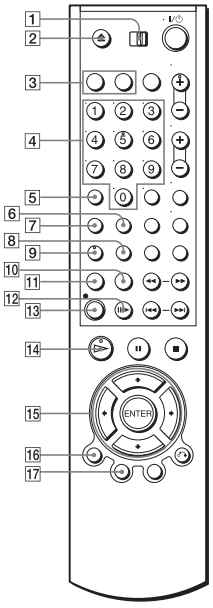
7 COMPONENT VIDEO OUT Pr/Pb/Y jacks (58)

8 S VIDEO OUT jack (57)

9 DIGITAL AUDIO OUT/OPTICAL jack (56)

10 DIGITAL AUDIO OUT/COAXIAL jack (56)

Remote commander



1 TV / DVD•VIDEO switch (9)

2 ⏏ button (31) (32) (37)
[for DVD] (open/close) button
[for VIDEO] (eject) button

3 SELECT DVD/VIDEO buttons (9)

4 Number buttons* (27)

5 CLEAR button (38) (43) (75)

6 SURROUND button (81)

7 SET UP button (19)

8 SUBTITLE/TIMER button (42) (73)
[for DVD] SUBTITLE button
[for VIDEO] TIMER button

9 AUDIO button* (80) (93)

10 BOOKMARK/SEARCH MENU button (78) (94)
[for DVD] BOOKMARK button
[for VIDEO] SEARCH MENU button

11 REPEAT/REPLAY button (37) (75)
[for DVD] REPEAT button
[for VIDEO] REPLAY button

12 ⏭ SKIP button (32) (38)

13 ● REC (record) button (40)

14 ▷ PLAY button* (32) (37)

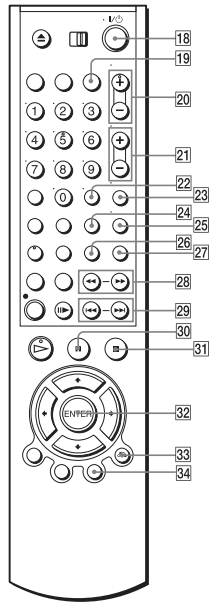
15 ↑/↓/←/→ button (19)

16 DISPLAY button (34) (40)

17 TOP MENU button (70)

* Number 5, AUDIO and ▷ PLAY buttons have a tactile dot. Use the tactile dot as a reference.

continued



18 I/⏻ (power) switch (10) (37)

19 VCR Plus+ button (50)

20 CH (channel)/TRACKING +/– buttons*1 (39) (96)

21 VOL (volume) +/– buttons (10)

22 ENTER button*2 (19)

23 MUTING/ZOOM button (10) (71)
[for DVD] ZOOM button
[for VIDEO] No function
[for Sony TV only] MUTING button

24 SP (Standard Play)/EP (Extended Play) button (40)

25 TV/VIDEO button (41)

26 ANGLE button (72)

27 INPUT SELECT button (41)

28 ◀◀/▶▶ SCAN/SLOW ⏭ buttons (32) (37)
[for DVD] ◀◀ SCAN button
▶▶ SCAN button
SLOW ⏭ button
[for VIDEO] ◀◀ (rewind) button
▶▶ (fast-forward) button
SLOW ⏭ button

29 ⏮/⏭ SHUTTLE PREV/NEXT buttons (32) (38)
[for DVD] ⏮ PREV (previous) button
⏭ NEXT (next) button
[for VIDEO] ⏮/⏭ SHUTTLE button

30 ⏸ PAUSE button (32) (37)

31 ■ STOP button (32) (37)

32 ENTER button*2 (19)

33 ↩ RETURN button (19)

34 MENU button (70)

*1 CH/TRACKING + button has a tactile dot. Use the tactile dot as a reference.

*2 The ENTER buttons 22 and 32 can be used interchangeably.

DVD Audio/Subtitle Language

Abbreviation	Language
ARA	Arabic
CHI	Chinese
CRO	Croatian
CZK	Czech
DAN	Danish
DEU	German
ENG	English
ESP	Spanish
FIN	Finish
FRA	French
GRE	Greek
HUN	Hungarian
IDN	Indonesian
IND	Hindi
ISL	Islandic
ITA	Italian
IWR	Hebrew
JPN	Japanese
KOR	Korean
MAL	Malay
NLD	Dutch
NOR	Norwegian
POL	Polish
POR	Portuguese
RUS	Russian
SVE	Swedish
THA	Thai
TUR	Turquish
VIE	Vietnamese
ZAF	Afrikaans

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2. DISASSEMBLY AND REASSEMBLY

2-1 CABINET AND PCB

2-1-1 Cabinet Top Removal

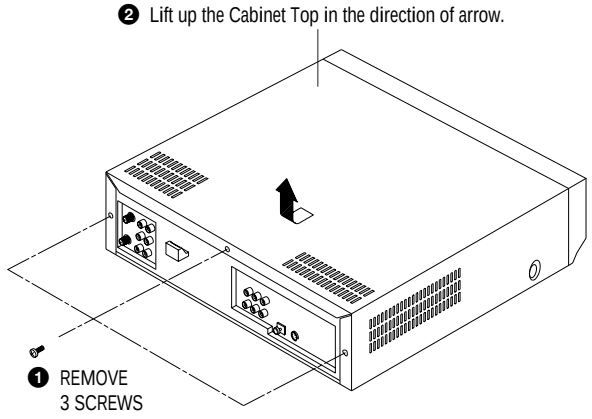


Fig. 2-1 Cabinet Top Removal

2-1-2 Bottom Cover Removal

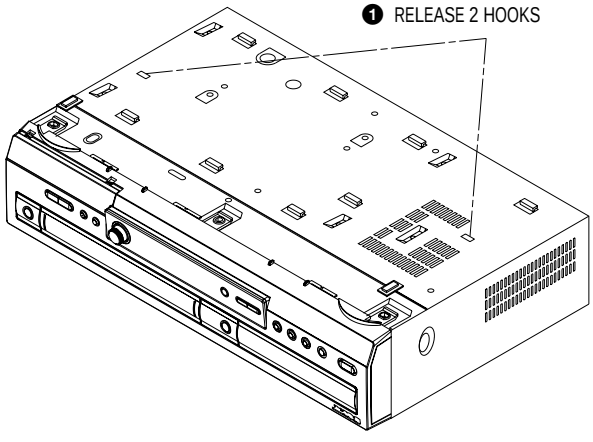


Fig. 2-2 Bottom Cover Removal

2-1-3 Ass'y Front Panel Removal

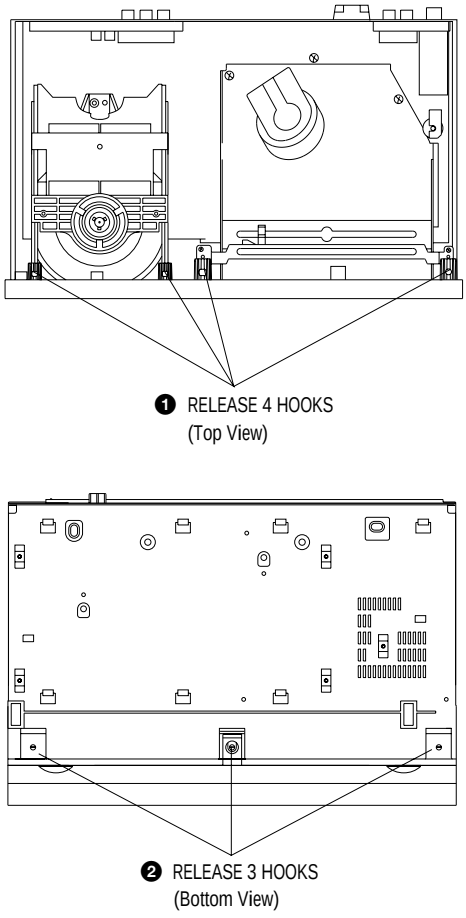


Fig. 2-3 Ass'y Front Panel Removal

2-1-4 Function PCB Removal

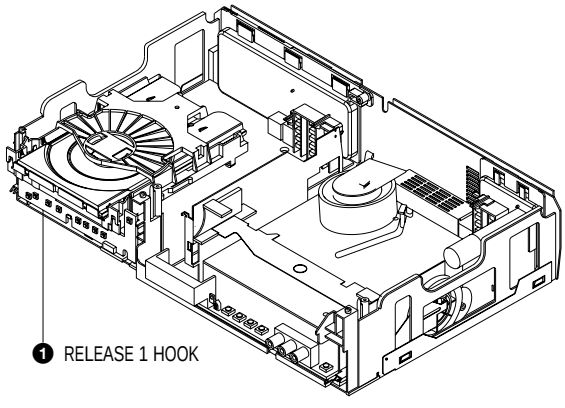


Fig. 2-4 Function PCB Removal

2-1-5 Chassis Removal

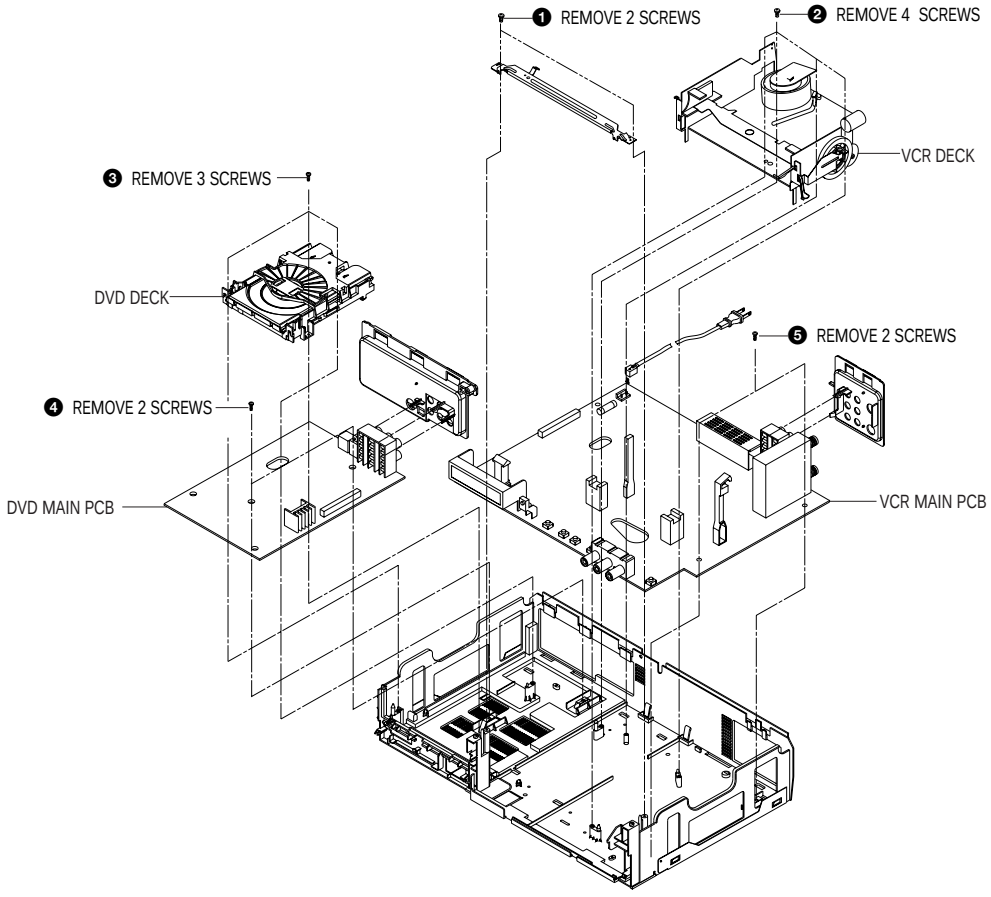


Fig. 2-5 Chassis Removal

2-1-6 VCR Main PCB Removal

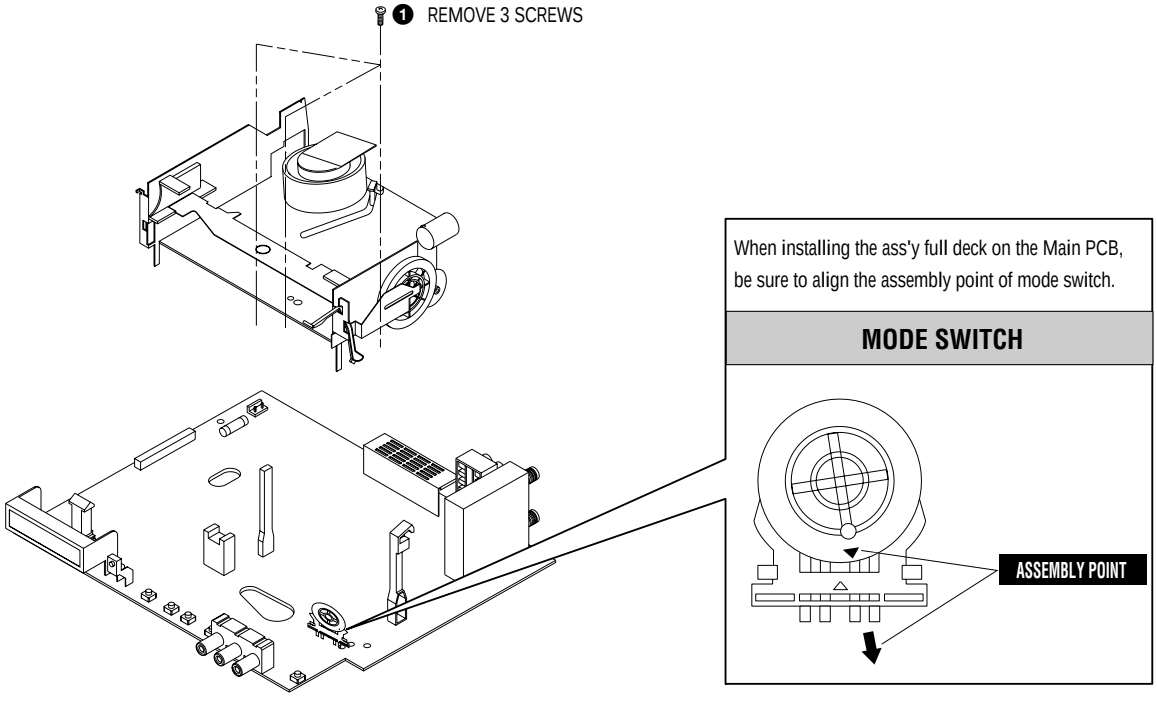

❶ REMOVE 3 SCREWS
When installing the ass'y full deck on the Main PCB, be sure to align the assembly point of mode switch.
MODE SWITCH
ASSEMBLY POINT

Fig. 2-6 VCR Main PCB Removal

2-2 CIRCUIT BOARD LOCATIONS

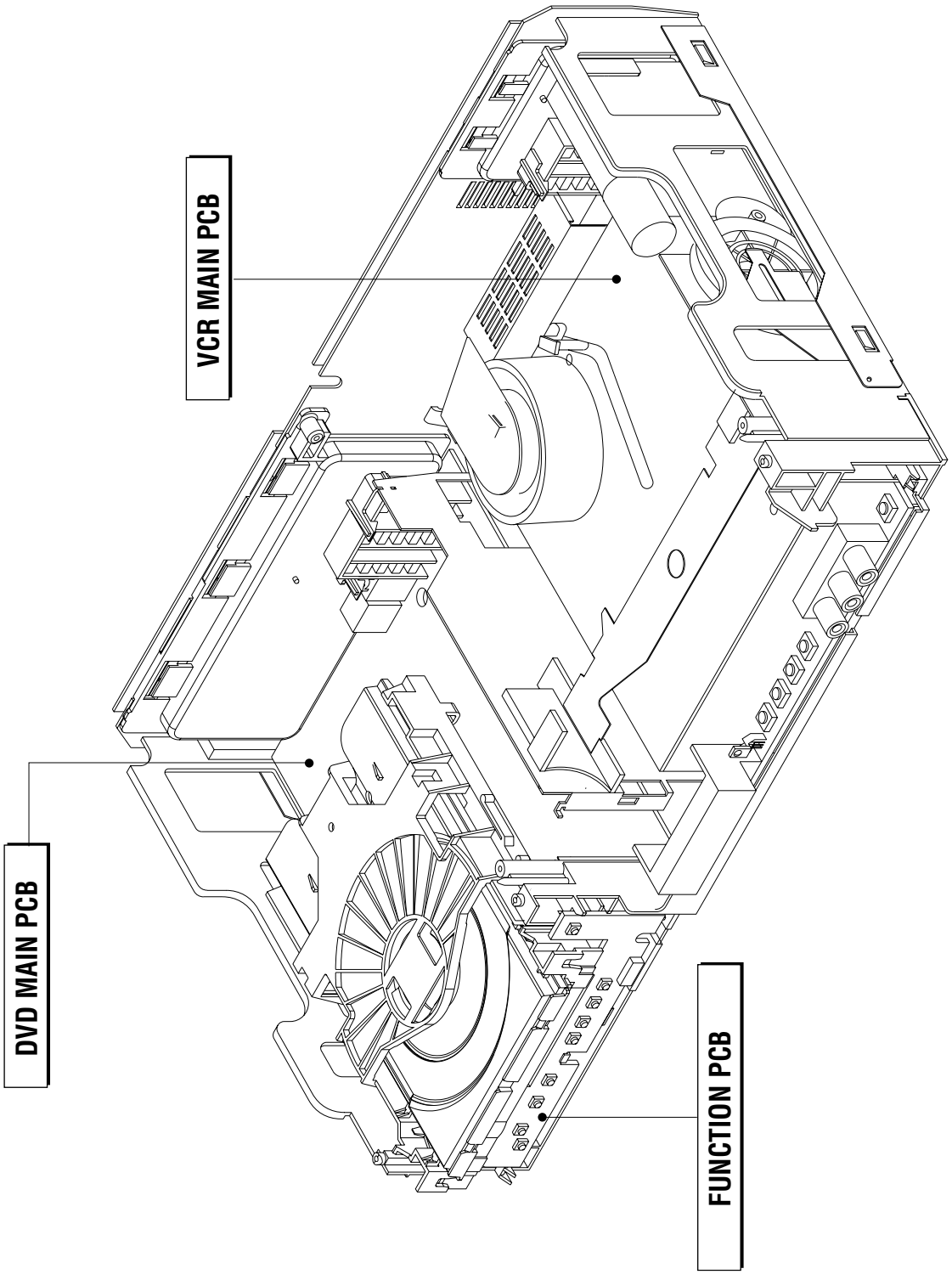


Fig. 2-7 Circuit Board Locations

2-3 VCR DECK PARTS LOCATIONS

2-3-1 Top View

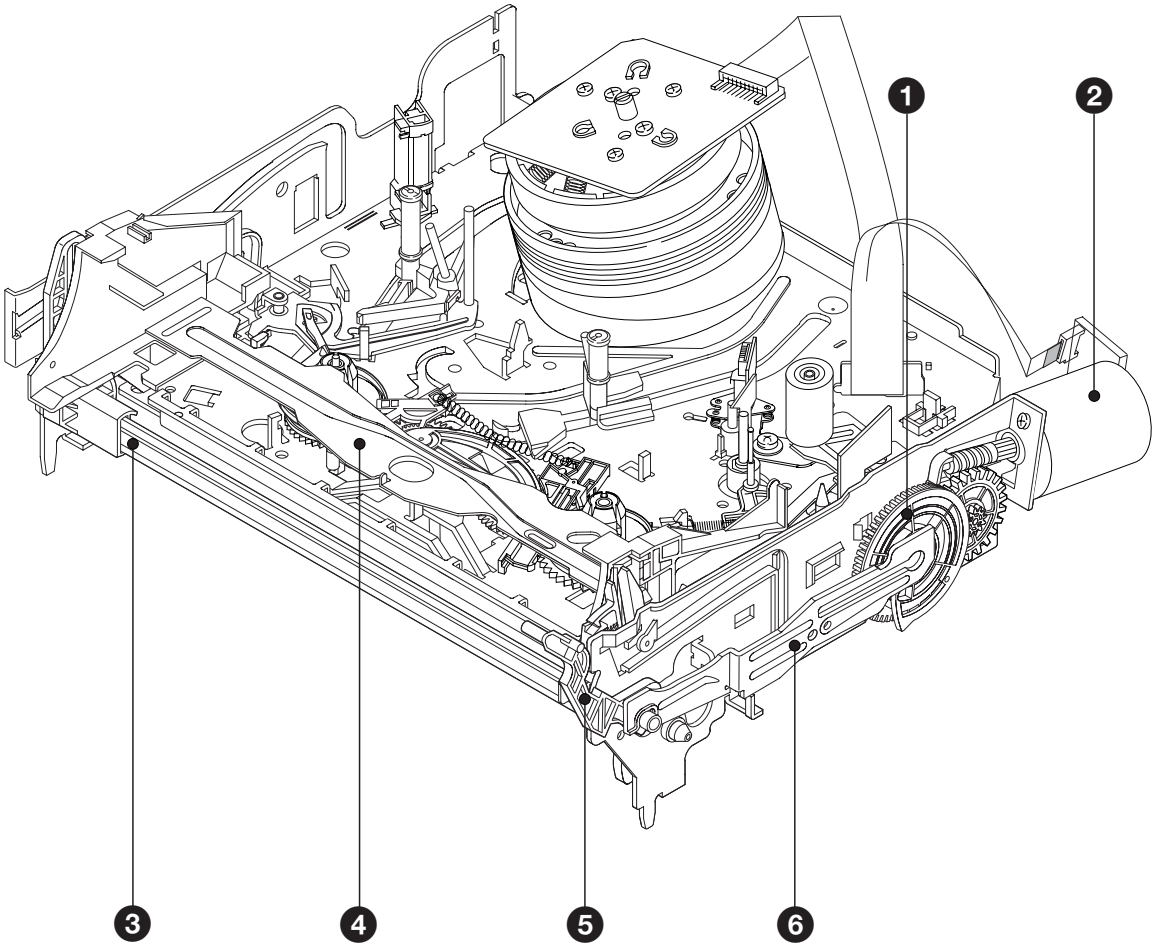


Fig. 2-8 Top parts Location-1

1. GEAR FL CAM
2. MOTOR LOADING ASS'Y
3. LEVER FL ARM ASS'Y
4. HOLDER FL CASSETTE ASS'Y
5. LEVER FL DOOR
6. SLIDER DRIVE

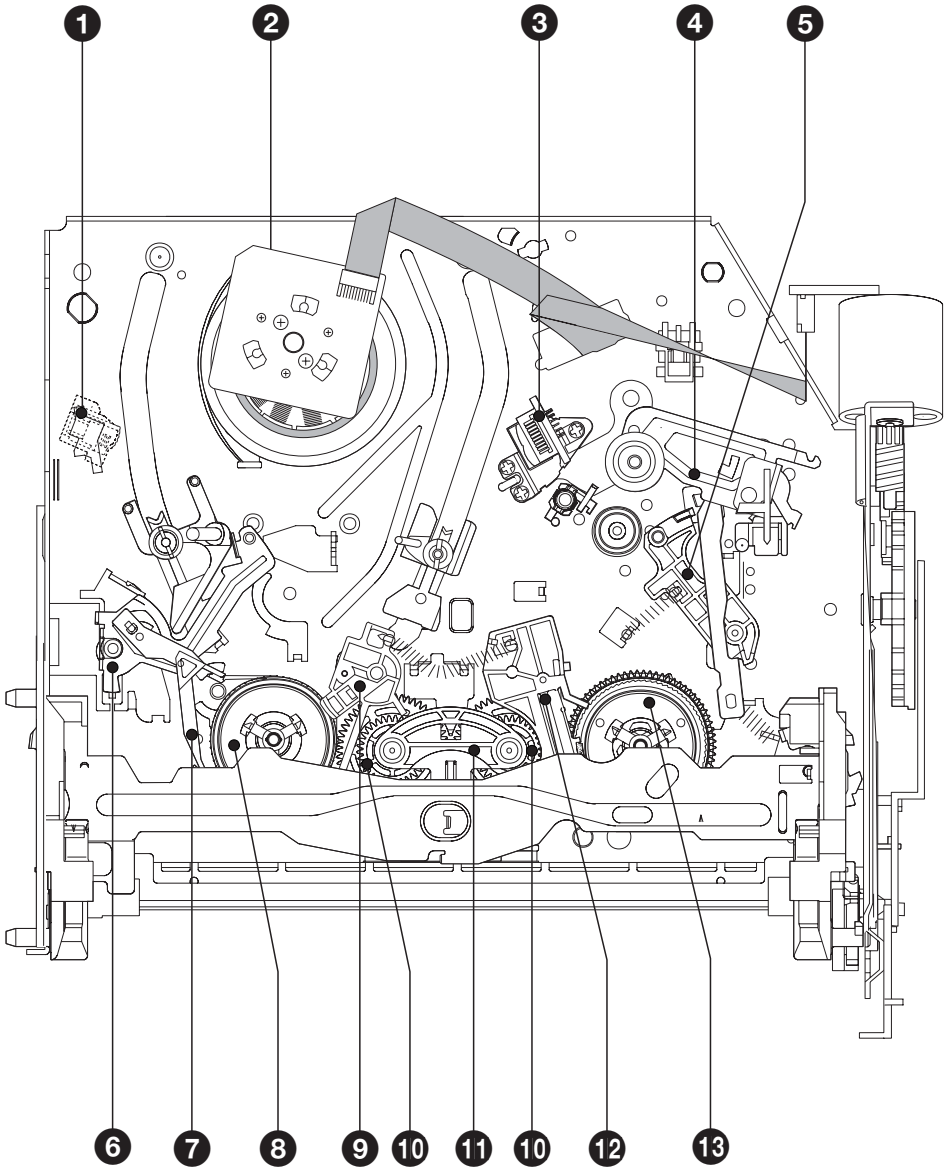


Fig. 2-9 Top Parts Location-2

1. FE HEAD
2. CYLINDER ASS'Y
3. ACE HEAD ASS'Y
4. LEVER UNIT PINCH ASS'Y
5. LEVER #9 GUIDE ASS'Y
6. LEVER TENSION ASS'Y
7. BAND BRAKE ASS'Y
8. DISK S REEL
9. LEVER S BRAKE ASS'Y
10. GEAR IDLE
11. LEVER IDLE
12. LEVER T BRAKE ASS'Y
13. DISK T REEL

2-3-2 Bottom View

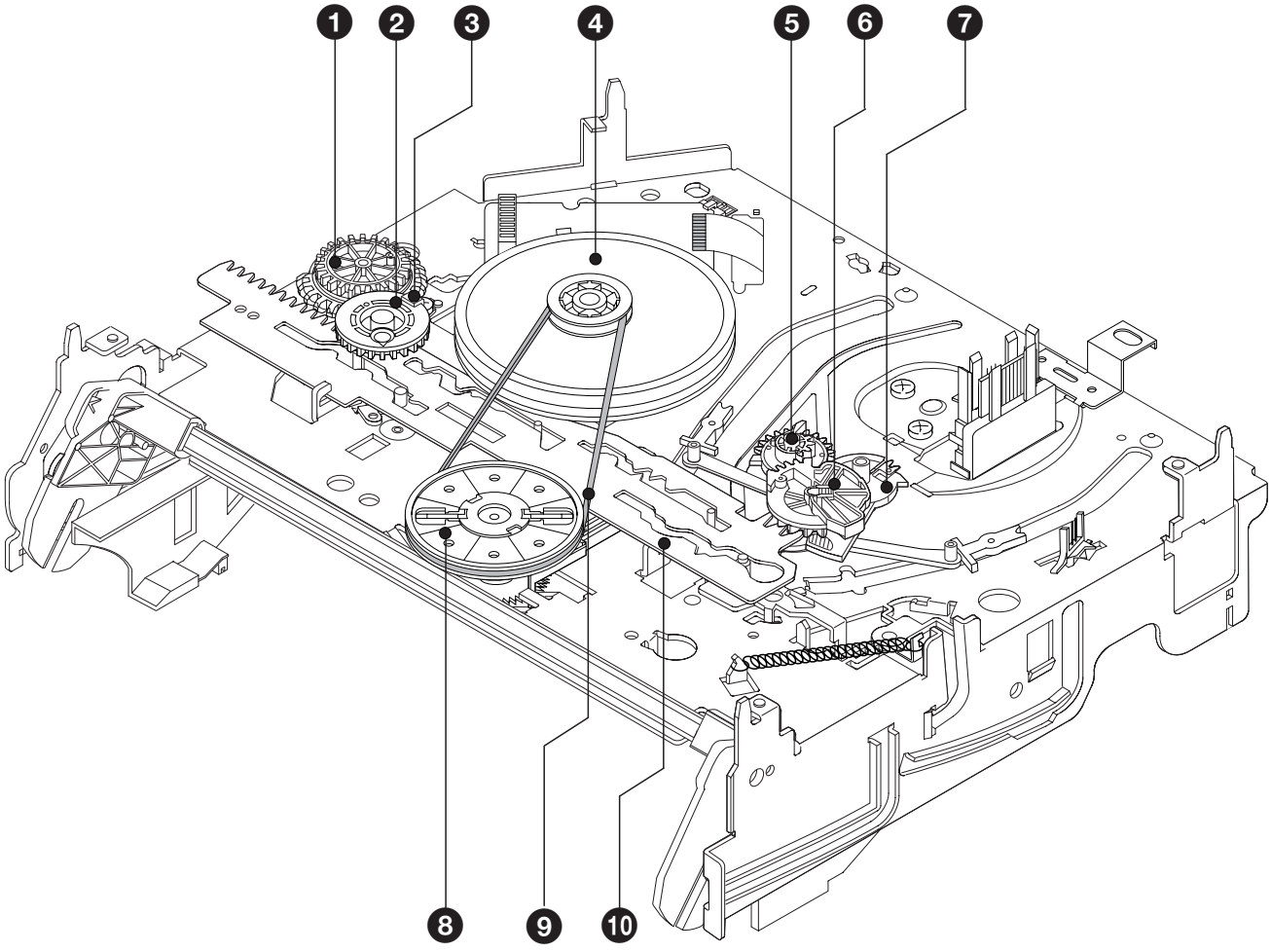


Fig. 2-10 Bottom Parts Location

1. GEAR JOINT 1
2. GEAR JOINT 2
3. BRAKET GEAR
4. MOTOR CAPSTAN ASS'Y
5. LEVER T LOAD ASS'Y
6. GEAR LOADING DRIVE
7. LEVER S LOAD ASS'Y
8. HOLDER CLUTCH ASS'Y
9. BELT PULLEY
10. SLIDER CAM

2-4 VCR DECK

2-4-1 Holder FL Cassette Ass'y Removal

1) Pull the Holder FL Cassette Ass'y ❶ to the eject position.
2) Pull the Holder FL Cassette Ass'y ❶ as grasping the Holder FL Cassette Ass'y ❶ and Lever FL Cassette-R ❷ in the same time to release hooking from Main Base until the Boss [A] of Holder FL Cassette Ass'y ❶ is taken out from the Rail [B].
3) Lift the Holder FL Cassette Ass'y ❶, in this time, you have to grasp the Lever FL Cassette-R ❷ Continuously until the Holder FL Cassette Ass'y ❶ is taken out completely.

Note: Be sure to insert Lever FL Cassette-R ❷ in the direction of "A" to prevent separation and breakage of the Lever FL Cassette-R ❷ at disassembling and reassembling.

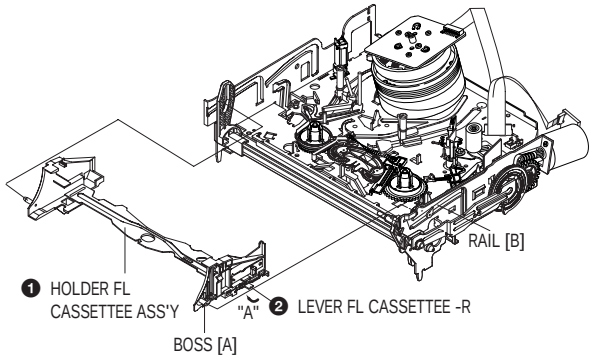


Fig. 2-11 Holder FL Cassette Ass'y Removal

2-4-2 Lever FL Door Removal

1) Release the Hook ❷ and Remove the Lever FL Door ❶ in the direction of arrow "A".

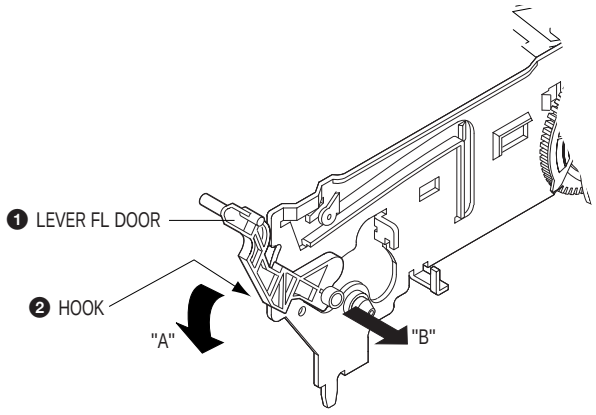


Fig. 2-12 Lever FL Door Removal

2-4-3 Slider FL Drive, Gear FL Cam Removal

1) Pull the Slider FL Drive ❶ to the front direction.
2) Remove the Slider FL Drive ❶ in the direction of arrow. (Refer to Fig. 2-13)
3) Remove the Gear FL cam ❷.

Note: When reinstalling be sure to reassemble Slider FL drive ❶ after you insert the Boss of Lever FL ARM-R in Groove of Slider FL drive ❶.

Assembly: Align the Gear FL Cam ❶ with the Gear worm wheel Post as shown drawing.
(Refer to Timing point)

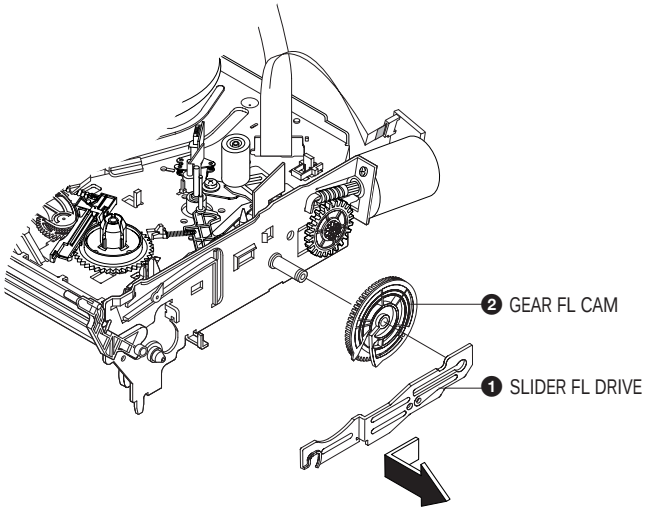


Fig. 2-13 Slider FL Drive Removal

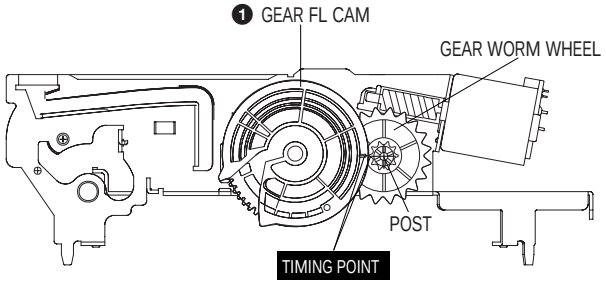


Fig. 2-14 Gear FL Cam, Gear Worm

2-4-4 Lever FL Arm Ass'y Removal

1) Push the hole "A" in the direction of arrow "B" use the pin.(about Dia. 2.5)
2) Pull out the Lever FL Arm Ass'y ❶ from the Boss of Main Base.
3) Remove the Lever FL Arm Ass'y ❶ in the direction of arrow "C".

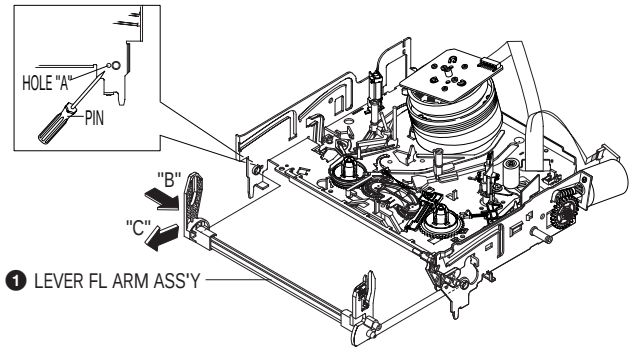


Fig. 2-15 Lever FL Arm Ass'y Removal

2-4-5 Gear Worm Wheel Removal

1) Remove the Gear Worm wheel ❶.

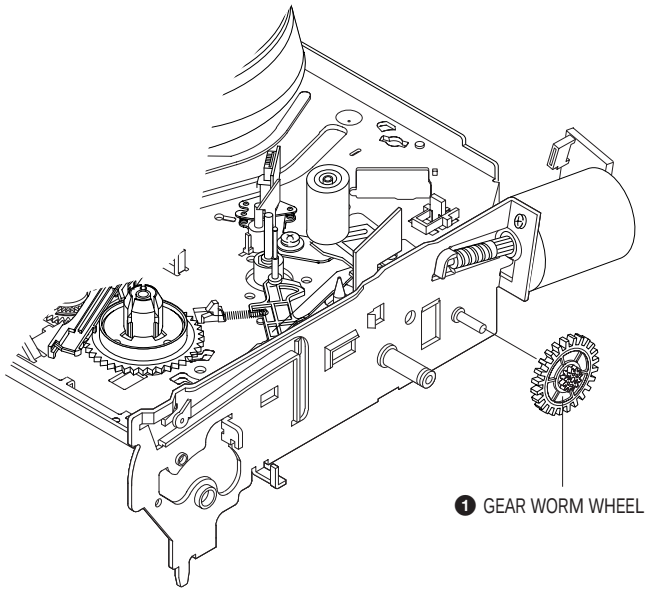


Fig. 2-16 Gear Worm Wheel Removal

2-4-6 Cable Flat Removal

1) Remove the Drum connecting part of Cable Flat ❶ from Connector Waffer ❷.
2) Remove the Loading Motor connecting part of Cable Flat ❶ from Connector Waffer ❸.

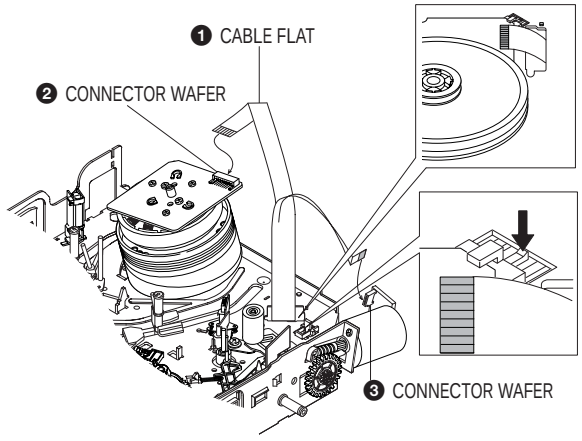


Fig. 2-17 Cable Flat Removal

2-4-7 Motor Loading Ass'y Removal

1) Remove the screw ❶.
2) Remove the Motor Loading Ass'y ❷.

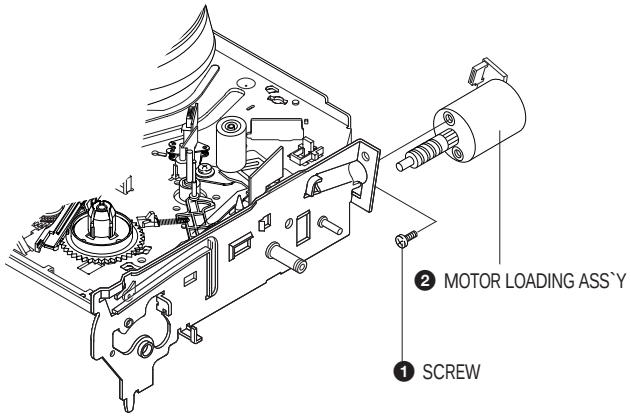


Fig.2-18 Motor Loading Ass'y Removal

2-4-8 Bracket Gear, Gear Joint 2, 1 Removal

1) Remove the SCREW ❶.
2) Remove the Bracket Gear ❷.
3) Remove the Gear Joint 2 ❸.
4) Remove the Gear Joint 1 ❹.

Assembly:

1) Be sure to align dot mark of Gear Joint 1 ❶ with dot mark of Gear Joint 2 ❷ as shown Fig 2-20.
   (Refer to Timing point1)
2) Confirm the Timing Point 2 of the Gear Joint 2 ❷ and Slider Cam ❸.

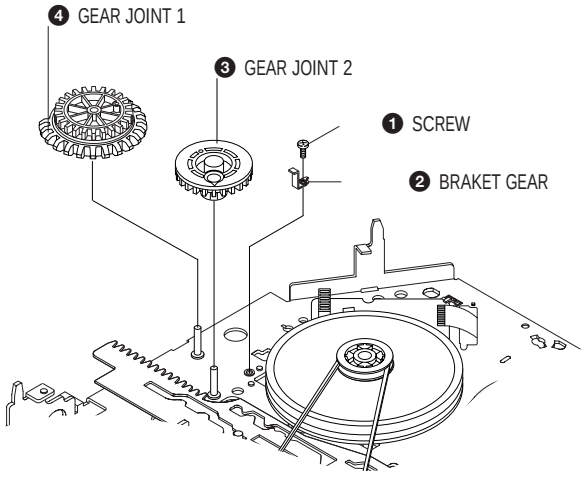


Fig. 2-19 Bracket Gear, Gear Joint 1,2 Removal

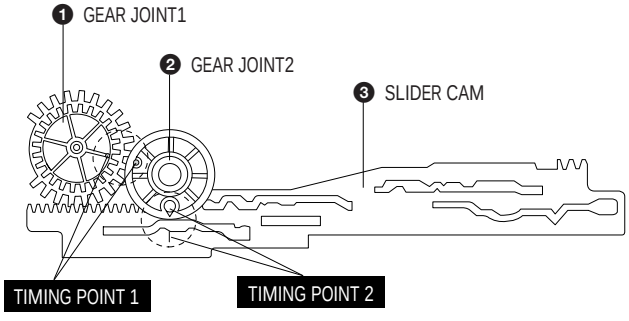


Fig. 2-20 Gear Joint 1,2 Assembly

2-4-9 Gear Loading Drive, Slider Cam, Lever Load S, T Ass'y Removal

1) Remove the Belt Pulley. (Refer to Fig. 2-38)
2) Remove the Gear Loading Drive ❶ after releasing Hook [A] in the direction arrow as shown in detail drawing.
3) Remove the Slider Cam ❷.
4) Remove the Lever Load ❸, Link Load ❺ & Lever Load ❹, Link Load ❻.

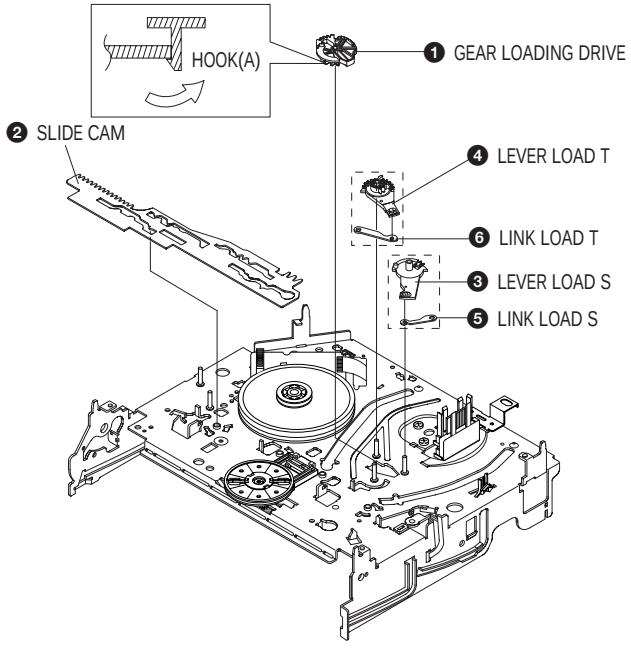


Fig. 2-21 Gear Loading Drive, Slider Cam, Lever T, S Load Ass'y Removal

2-4-10 Gear Loading Drive, Slider Cam, Lever Load S, T Ass'y Assembly

1) When reinstalling, be sure to align dot of Lever Load T Ass'y ❶ with dot of Lever Load S Ass'y ❷ as shown in drawing, (Refer to Timing Point 1).
2) Insert the Pin A,B,C,D into the Slider Cam ❸ hole,
3) Be sure to align dot of Lever Load T ❶ and dot of Gear Loading Drive ❹, (Refer to Timing Point 2).
4) Aline dot of Gear Loading drive ❹ with mark of Slider Cam ❸ as shown in drawing (Refer to Timing Point 3).

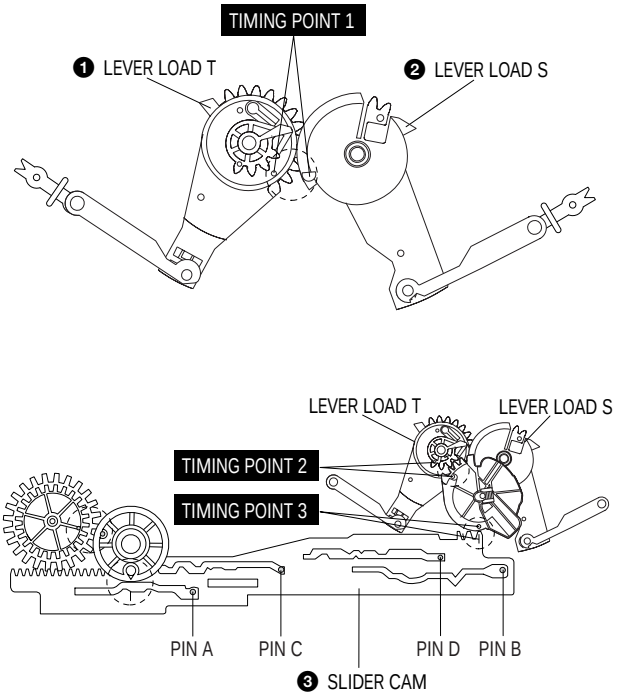


Fig. 2-22 Gear Loading Drive, Slider Cam, Lever Load S, T Ass'y Assembly

2-4-11 Lever Pinch Drive, Lever Tension Drive Removal

1) Remove the Lever Pinch Drive ❶, Lever Tension Drive ❷.

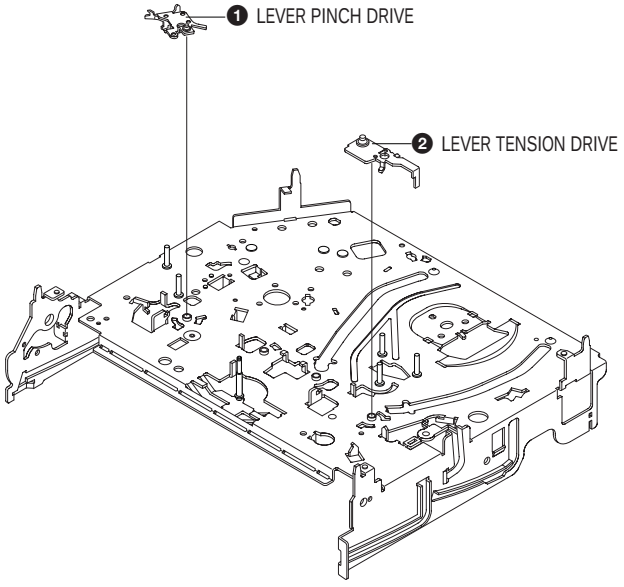


Fig. 2-23 Lever Pinch Drive,
Lever Tension Drive Removal

2-4-12 Lever Tension Ass'y, Band Brake Ass'y Removal

1) Remove the Lever Brake S Ass'y (Refer to Fig 2-25).
2) Remove the Spring Tension Lever ❶.
3) Rotate stopper of Main Base in the direction of arrow "A".
4) Lift the Lever Tension Ass'y ❷ & Band brake Ass'y ❸.

Note:

1) When replacing the Lever Tension Ass'y ❷, be sure to apply Grease on the post,
2) Take care not to touch stain on the felt side, and not to be folder and broken Band brake Ass'y
3) After Lever Tension Ass'y seated, Rotate stopper of Main Base to the Mark[B].

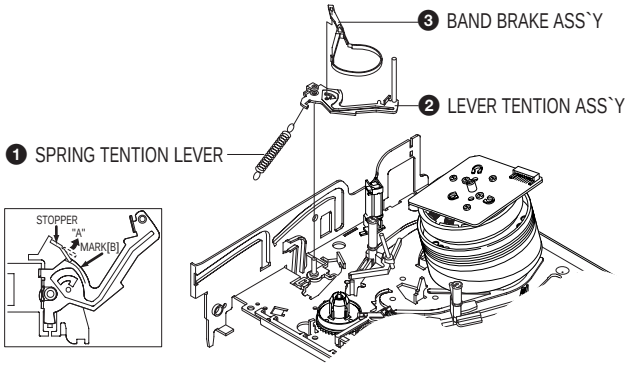


Fig. 2-24 Lever Tension Ass'y,
Band Brake Ass'y Removal

2-4-13 Lever Brake S, T Ass'y Removal

1) Release the Hook [A] and the Hook [B], [C] in the direction of arrow as shown in Fig 2-25.
2) Lift the Lever S, T Brake Ass'y ❶, ❷ with spring brake ❸.

Assembly:

1) Assembly the Lever S Brake Ass'y ❶ on the Main Base.
2) Assembly the Lever T Brake Ass'y ❷ with spring brake ❸.

Note: Take extreme care not to be folded and transformed Spring Brake at removing or reinstalling.

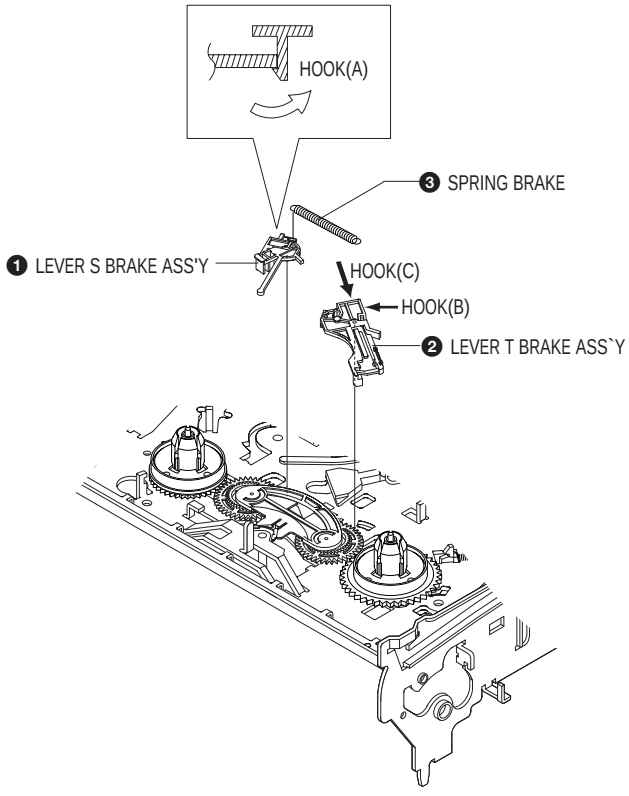


Fig. 2-25 Lever Brake S, T Ass'y Removal

2-4-14 Gear Idle Ass'y Removal

1) Push the Lever Idle ❶ in the direction of arrow "A", "B".
2) Lift the Lever Idle ❶.

Assembly:

1) Apply oil in two Bosses of Lever Idle ❶.
2) Assemble the Gear Idle ❷ with the Lever Idle ❶.

Note: When replacing the Gear Idle ❷, be sure to add oil in the boss of Lever Idle ❶.

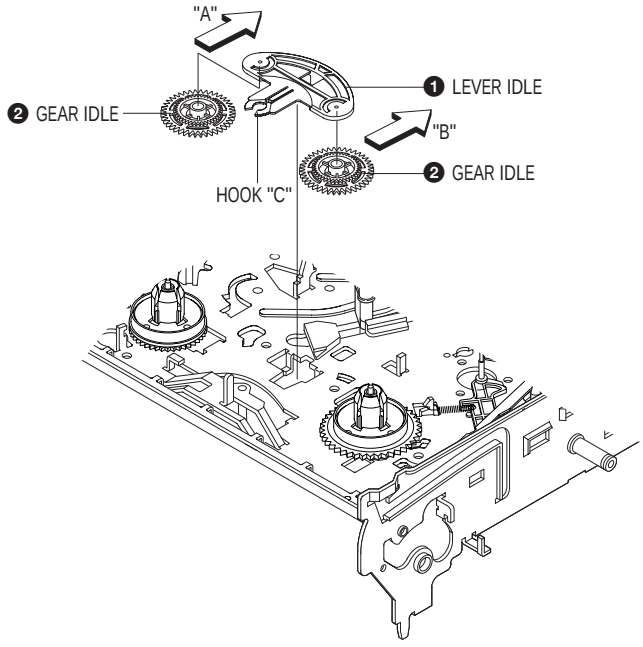


Fig. 2-26 Gear Idle Ass'y Removal

2-4-15 Disk S, T Reel Removal

1) Lift the Disk S, T Reel ❶, ❷.

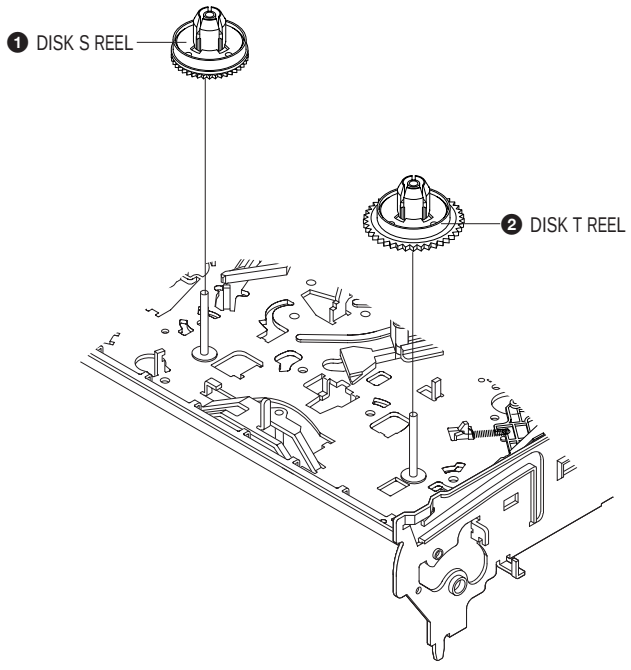
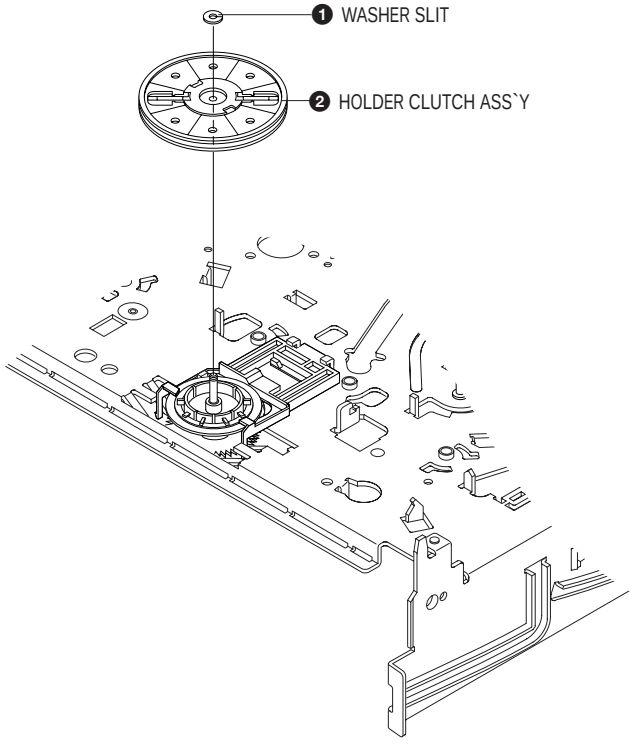


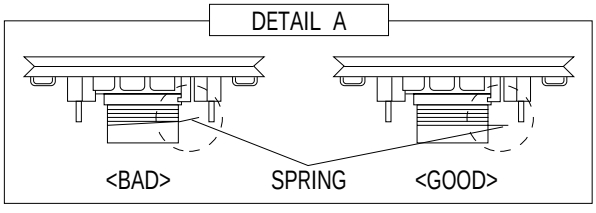
Fig. 2-27 Disk S, T Reel Removal

2-4-16 Holder Clutch Ass'y Removal

1) Remove the Washer Slit ❶.
2) Lift the Holder Clutch Ass'y ❷.

Note: When you reinstall Holder Clutch Ass'y
1) Check the condition of spring as shown in detail A.
2) Don't push Holder Clutch Ass'y down with excessive force Just insert Holder Clutch Ass'y into post center with dead force and Rotate it smoothly.
   Be sure to confirm that spring is in the slit of Gear Center Ass'y as shown in detail B.





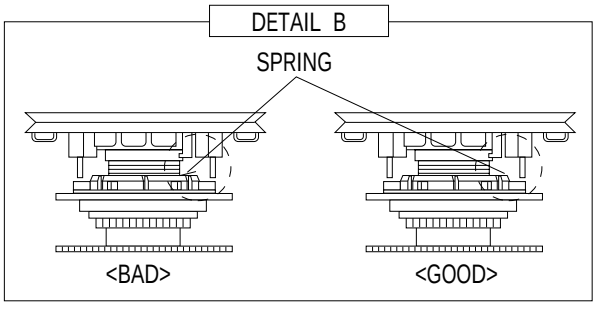


Fig. 2-28 Holder Clutch Ass'y Removal

2-4-17 Lever Up Down Ass'y, Gear Center Ass'y Removal

1) Remove the 2 hooks in the direction of arrow as shown Fig. 2-29 and lift the Lever Up Down Ass'y ❶.
2) Lift the Gear Center Ass'y ❷.

Assembly:

1) Insert the Lever Up Down Ass'y ❶ in the rectangular holes on Main Base as shown in Fig 2-30.
2) Lift the Lever Up Down Ass'y ❶ about 35°.
   (Refer to Fig 2-30)
3) Insert Ring of the Gear Center Ass'y ❷ in the Guide of the Lever Up Down Ass'y ❶.
4) Insert the Gear Center Ass'y ❷ in the post on Main Base.
5) Push down the Lever Up Down Ass'y ❶ for locking of the Hook.

Note:

1) Take care not to separate and sentence does not mark sense.
2) Be sure to confirm that Ring of the Gear Center Ass'y ❷ is in the Guide of the Lever Up Down Ass'y ❶ after finishing assembly of Lever Up Down Ass'y ❶ and Gear Center Ass'y ❷.

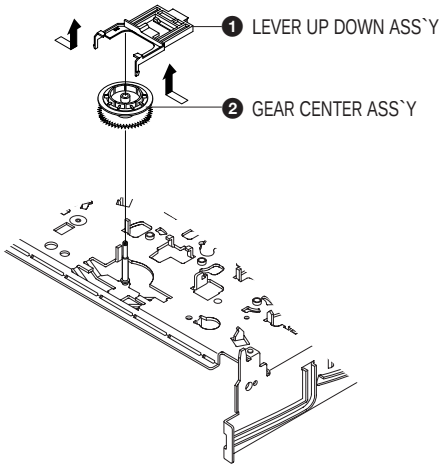


Fig. 2-29 Lever Up Down Ass'y Removal

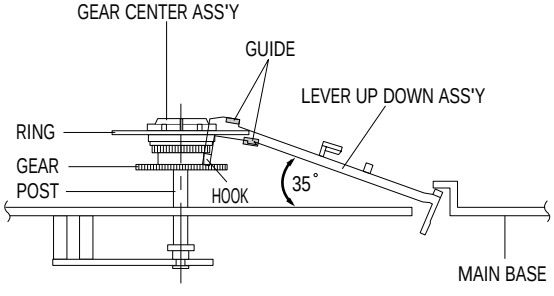


Fig. 2-30 Lever Up Down Ass'y Removal

2-4-18 Guide Cassette Door Removal

1) Lift the Hook [A].
2) Rotate the Guide Cassette Door ❶ in the direction of arrow.

Note: After reinstalling the Guide Cassette Door ❶ sure the Hook [A].

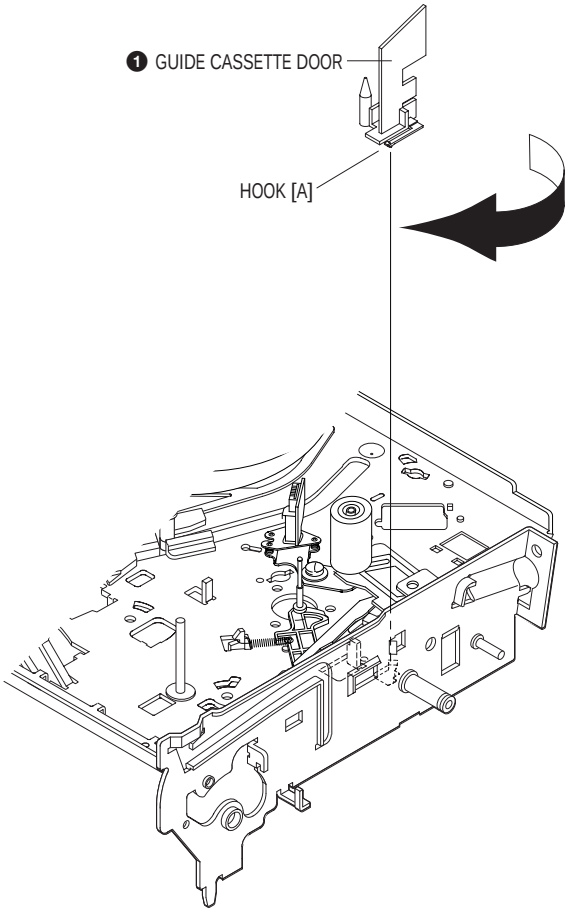


Fig. 2-31 Guide Cassette Door Removal

2-4-19 Lever Unit Pinch Ass'y, Plate Joint, Spring Pinch Drive Removal

1) Lift the Unit Pinch Ass'y ❶.
2) Remove the Plate Joint ❷ from Lever Pinch Drive.
3) Remove the Spring Pinch Drive ❸.

Note:
1) Take extreme care not to touch the grease on the Roller Pinch.
2) When reinstalling, be sure to apply grease on the post pinch roller.

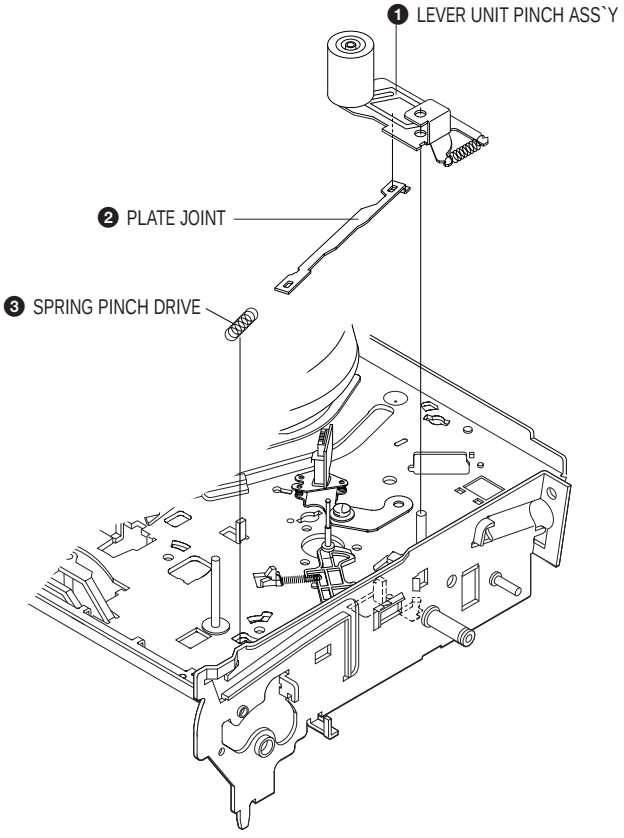


Fig. 2-32 Lever Unit Pinch Ass'y, Plate Joint, Spring Pinch Drive Removal

2-4-20 Lever #9 Guide Ass'y Removal

1) Remove the Spring #9 Guide ❶.
2) Lift the Spring #9 Guide Ass'y ❷ in the direction of arrow "A".

Note:
1) Take extreme care not to get grease on the tape Guide Post.
2) After reinstalling, check the bottom side of the Post #9 Guide to the top side of Main Base.

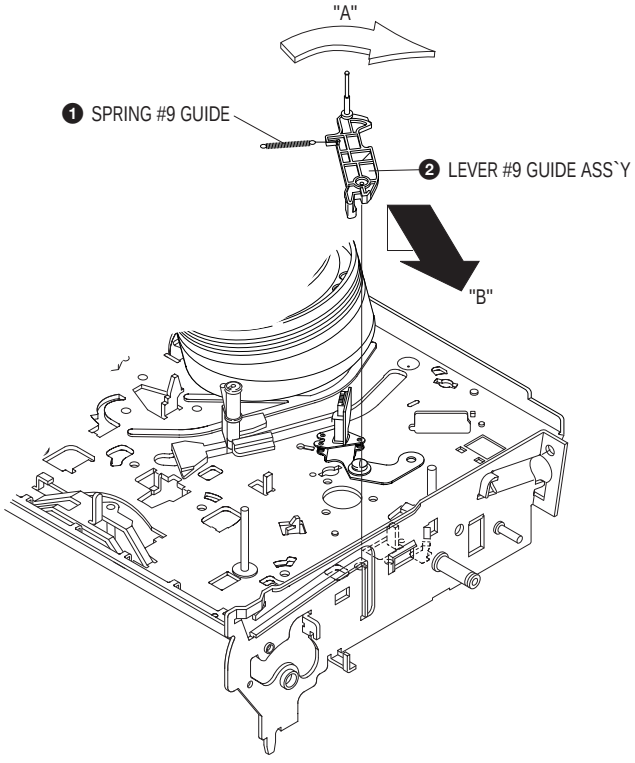


Fig. 2-33 Lever #9 Guide Ass'y Removal

2-4-21 FE Head Removal

1) Remove the screw ❶.
2) Lift the FE Head ❷.

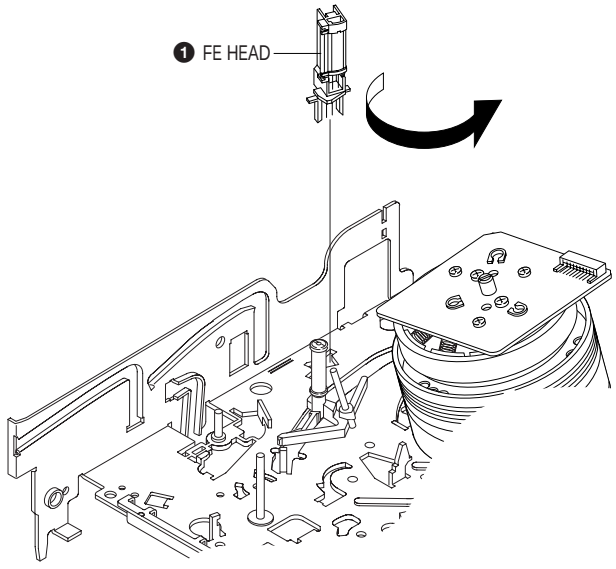


Fig. 2-34 FE Head Removal

2-4-22 ACE Head Removal

1) Pull out the FPC from connector of ACE Head Ass'y ❷.
2) Remove the screw ❶.
3) Lift the ACE Head Ass'y ❷.

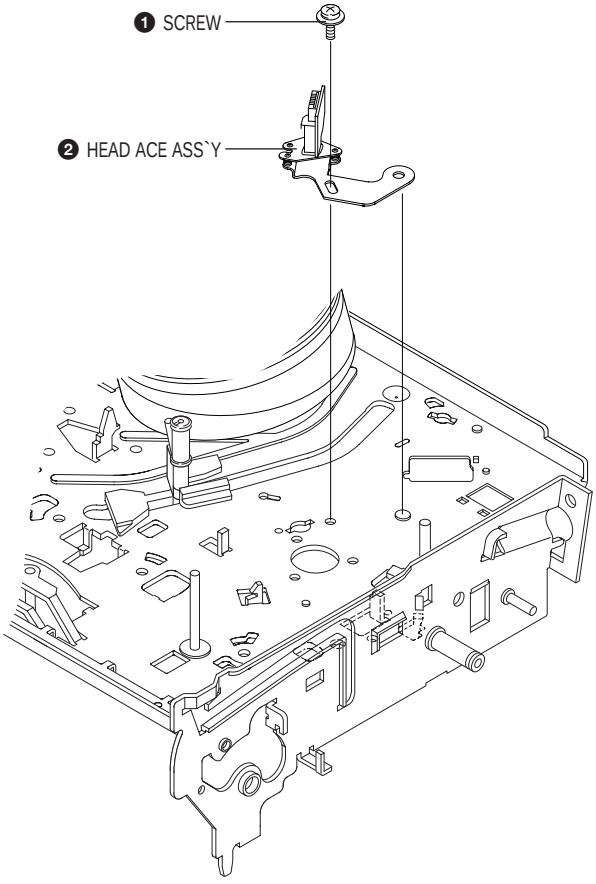


Fig. 2-35 ACE Head Removal

2-4-23 Slider S, T Ass'y Removal

1) Move the Slider S, T Ass'y ❶, ❷ to slot, and then lift it to remove. (Refer to arrow)

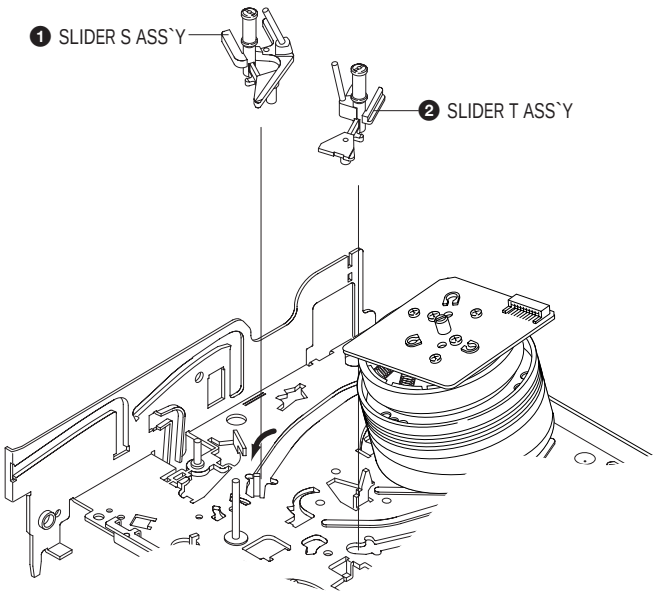


Fig. 2-36 Slider S, T Ass'y Removal

2-4-24 Plate Ground Deck, Cylinder Ass'y Removal

1) Remove the 3 Screws ❶.
2) Lift the Plate Ground Deck ❷.
3) Lift the Cylinder Ass'y ❸.

Assembly:

1) Match the 3 holes in the bottom of Cylinder Ass'y ❸ to the 3 holes of Main Base as attending not to drop or knock the Cylinder Ass'y ❸.
2) Tighten the 1 Screw ❶.
3) Match the Plate Ground Deck ❷ to the Hole of Base Main.
4) Tighten the other 2 Screws ❶.

Note:

1) Take care not to touch the Cylinder Ass'y ❸ and the tape guide post at reinstalling.
2) When reinstalling, Don't push down too much on Screw Driver.

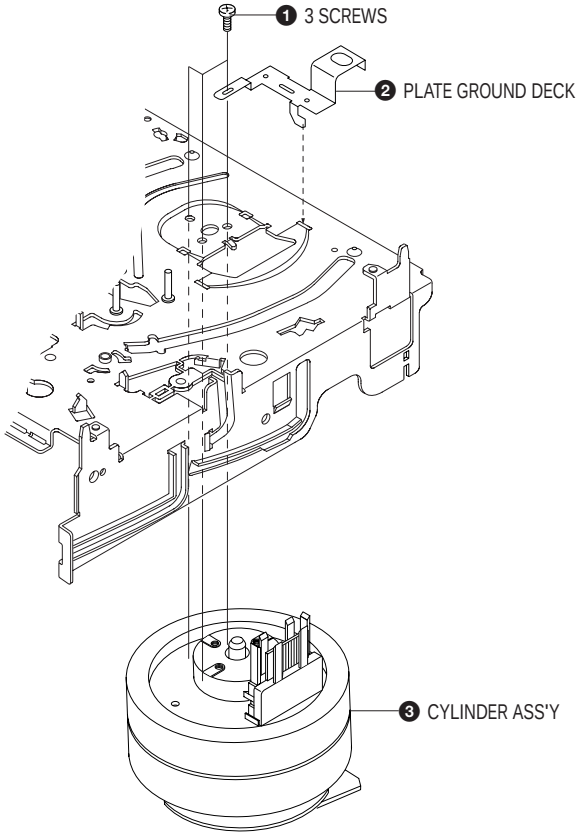


Fig. 2-37 Plate Ground Deck, Cylinder Ass'y Removal

2-4-25 Belt Pulley Removal

1) Remove the Belt Pulley ❶.

Note: Take extreme care not to get grease on Belt Pulley ❶ at assembling or reassembling.

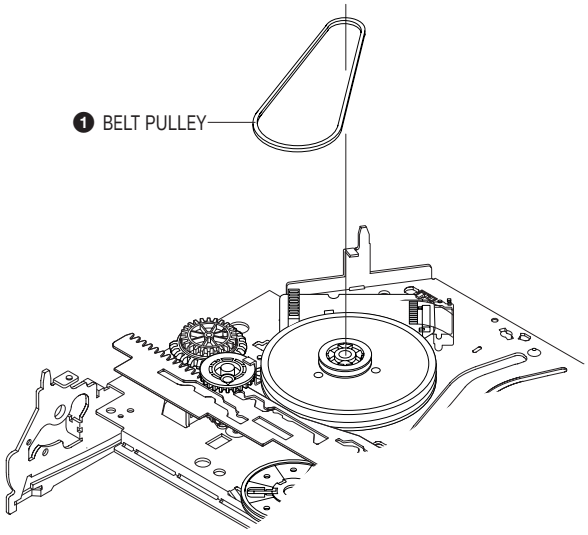


Fig. 2-38 Belt Pulley Removal

2-4-26 Motor Capstan Ass'y Removal

1) Remove the Damper Capstan ❶ in the direction of arrow.
2) Remove the 3 Screws ❷.
3) Remove the Motor Capstan Ass'y ❸.

Assembly:

1) Match the 3 holes of Motor Capstan Ass'y ❸ to the 3 holes of Main Base. Be careful not to drop or knock the Motor Capstan Ass'y ❸.
2) Tighten the 3 Screws ❷ in the direction of arrow as shown detail drawing.
3) Assemble the Damper Capstan ❶.

Note: After tightening screws, check if there is gap between the head of screws and the top side of Main Base. There should have no gap between the head of screws and the top side of Main Base.
After reinstalling, adjusting the tape transport system again.

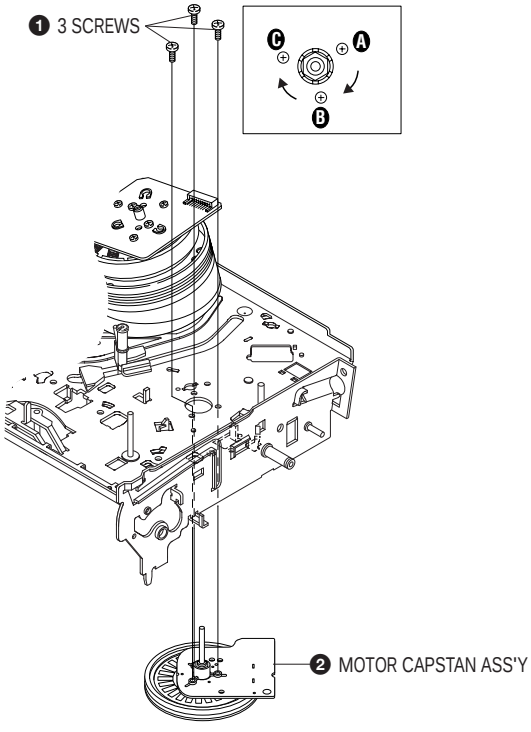


Fig. 2-39 Motor Capstan Ass'y Removal

2-4-27 Post #8 Guide Ass'y Removal

1) Rotate the Post #8 Guide Ass'y ❶ in the direction of arrow to lift up.

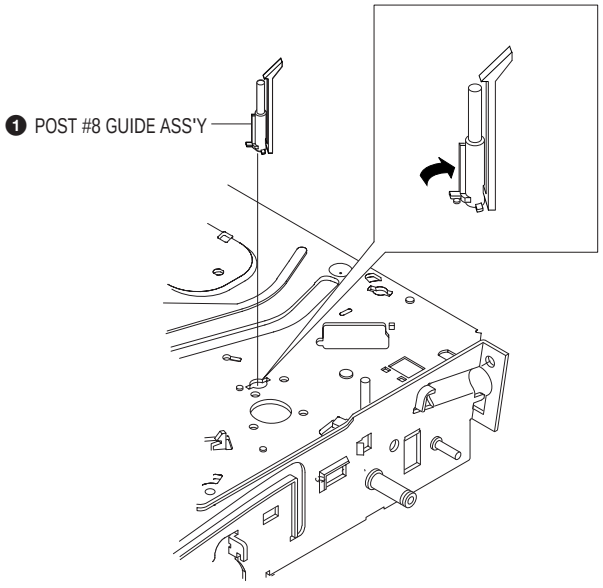


Fig. 2-40 Post #8 Guide Ass'y Removal

2-4-28 Level Head Cleaner Ass'y Removal (Optional)

1) Release the Hook ❶.
2) Lift the Lever Head Cleaner Ass'y ❷.

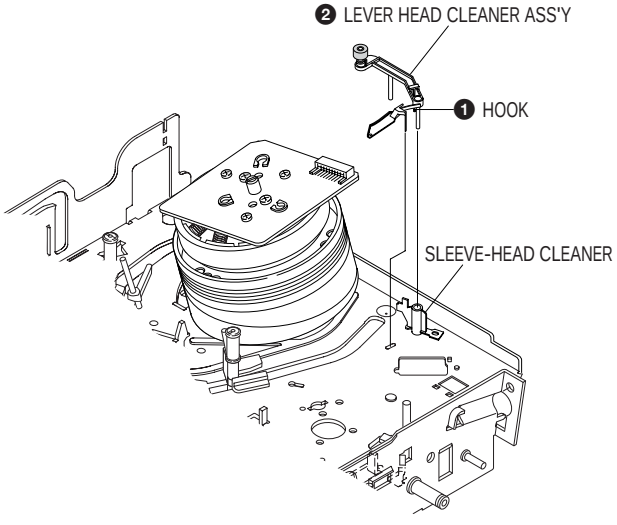


Fig. 2-41 Lever Head Cleaner Ass'y Removal

2-4-29 How to Eject the Cassette Tape (If the unit does not operate on condition that is inserted into housing Ass'y)

1) Turn the Gear worm ❶ clockwise with screw driver.(Refer to arrow)
   (Other method: Remove the Screw of Motor Load Ass'y, Separate the Motor Load Ass'y)

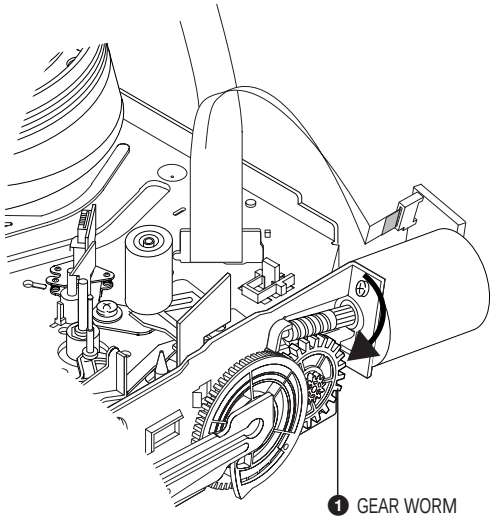


Fig. 2-42

2) When Slider S,T are approched in the position of unloading, rotate holder Clutch counterclockwise after inserting screw driver in the hole of frame's bottom in order to wind the unwinded tape.
   (Refer to Fig.2-43)
   (If you rotate Gear Worm ❶ continuously when tape is in state of unwinding, you may cause a tape contamination by grease and tape damage.
   Be sure to wind the unwinded tape in the state of set horizontly.)
3) Rotate Gear Worm ❶ clockwise using screw driver again up to the state of eject mode and then pick out the tape.(Refer to Fig.2-42)

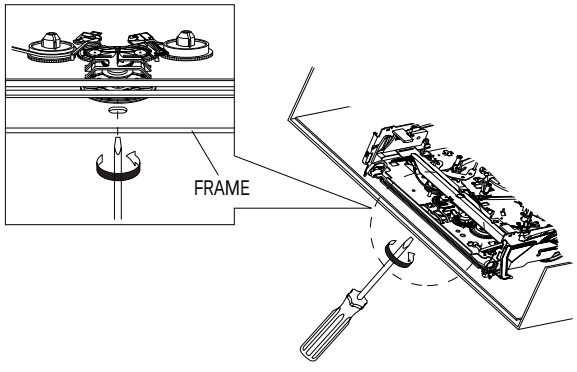


Fig. 2-43

2-5 THE TABLE OF CLEANING, LUBRICATION AND REPLACEMENT TIME ABOUT PRINCIPAL PARTS

1) The replacement time of parts is not life of parts.
2) The table 2-1 is that the VCR Set is in normal condition (normal temperature, normal humidity).
   The checking period may be changed owing to the condition of use, runtime and environmental conditions.
3) Life of the Cylinder Ass'y is depend on the condition of use.
4) See exploded view for location of each parts.

<Table 2-1>

*	Parts Name	Checking Period										Remark
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
TAPE PATH SYSTEM	POST TENSION	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	- To clean the parts, use patch and alcohol (solvent). - After cleaning, use the video tape after alcohol is gone away completely. - We recommend to use oil [EP-50] or solvent. - One or two drops of oil should be applied after cleaning with alcohol.
	SLANT POST S, T	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
	#8 GUIDE SHAFT	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
	CAPSTAN SHAFT	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
	#9 GUIDE POST	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
	#3 GUIDE POST	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
	GUIDE ROLLER S, T	Δ	Δ	Δ	O	O	O	O	O	O	O	
	CYLINDER ASS'Y	Δ	O	O	O	O	O	O	O	O	O	
	FE HEAD	Δ	Δ	Δ	O	O	O	O	O	O	O	
	ACE HEAD	Δ	O	O	O	O	O	O	O	O	O	
	PINCH ROLLER	Δ	O	O	O	O	O	O	O	O	O	
	POST REEL S, T		◆		◆		◆		◆		◆	- Periodic time of applying oil (Apply oil after cleaning) - The excessive applying oil may be the cause of malfunction.
	SLEEVE TENSION		◆		◆		◆		◆		◆	
	POST CENTER		◆		◆		◆		◆		◆	
	LEVER IDLE BOSS (2Point)		◆		◆		◆		◆		◆	
DRIVING SYSTEM	CAPSTAN MOTOR PULLEY	Δ	Δ	Δ	Δ	Δ	O	O	O	O	O	
	BELT PULLEY				O	O	O	O	O	O	O	
	HOLDER CLUTCH ASS'Y	Δ	O	O	O	O	O	O	O	O	O	
	GEAR CENTER ASS'Y		O	O	O	O	O	O	O	O	O	
	GEAR IDLE (2Point)		O	O	O	O	O	O	O	O	O	
	LOADING MOTOR		O	O	O	O	O	O	O	O	O	
BRAKE SYSTEM	BAND BRAKE ASS'Y		O	O	O	O	O	O	O	O	O	
	BRAKE T ASS'Y		O	O	O	O	O	O	O	O	O	

Δ : Cleaning O : Check and replacement in necessary ◆ : Add Oil

2-6 DVD DECK

2-6-1 Tray Disc Removal

1) Insert a Screw Driver ❶ into Emergency Hole ❷ and push the Slider Housing ❸ in the direction arrow “A”.
2) When the Tray Disc ❹ comes out a little, pull it in the direction arrow “B” by hand.
3) Pull the Tray Disc ❹ to disassemble , while simultaneously pushing 2 Stoppers ❺ (left, right) in the direction arrow “C”, “D”.

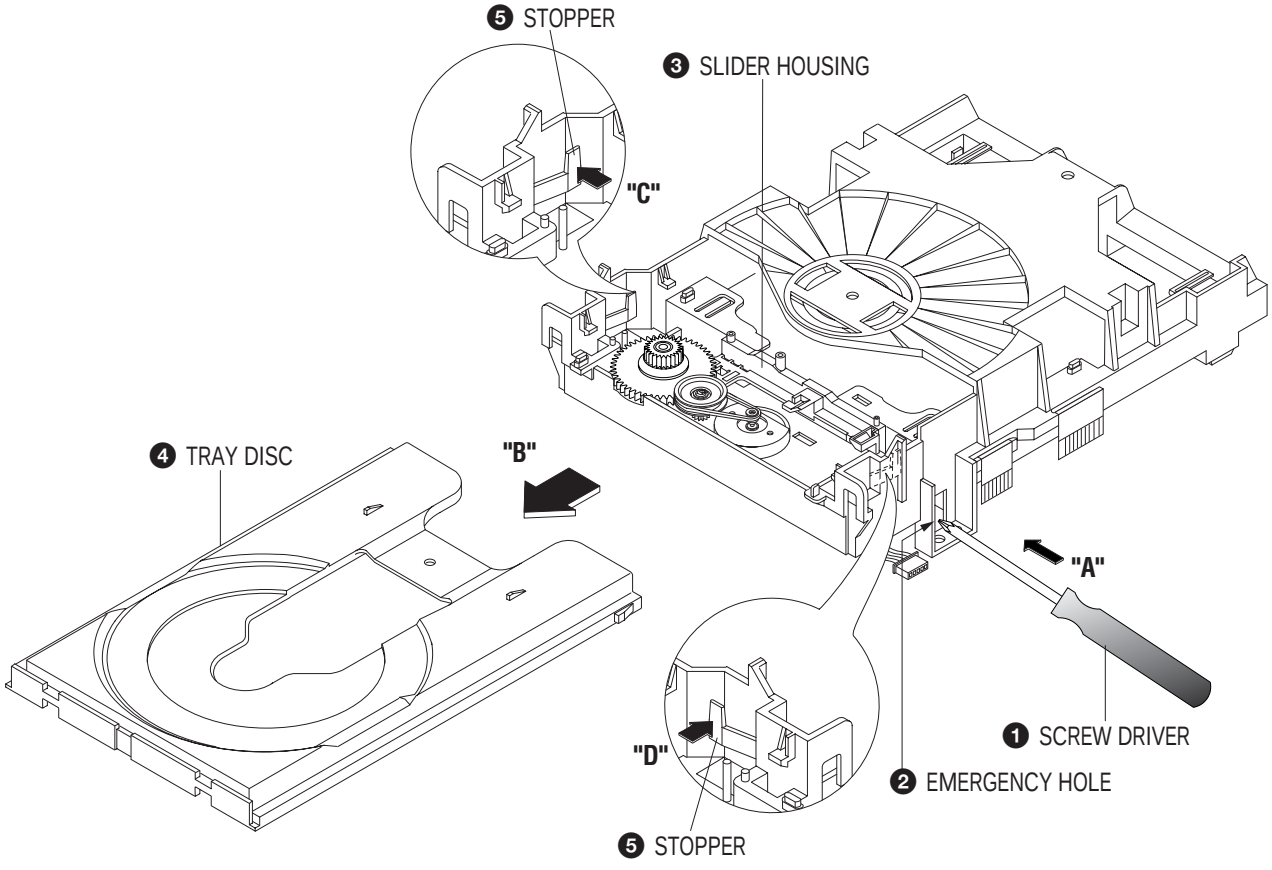


Fig. 2-44 Tray Disc Removal

2-6-2 Assy P/U Deck Removal

1) Disconnect DCN2 ❶, DCN3 ❷.
2) Lift down the Assy P/U Deck ❸ while simultaneously pushing 2 Hooks ❹, ❺ in the direction of arrow “A”, “B”.

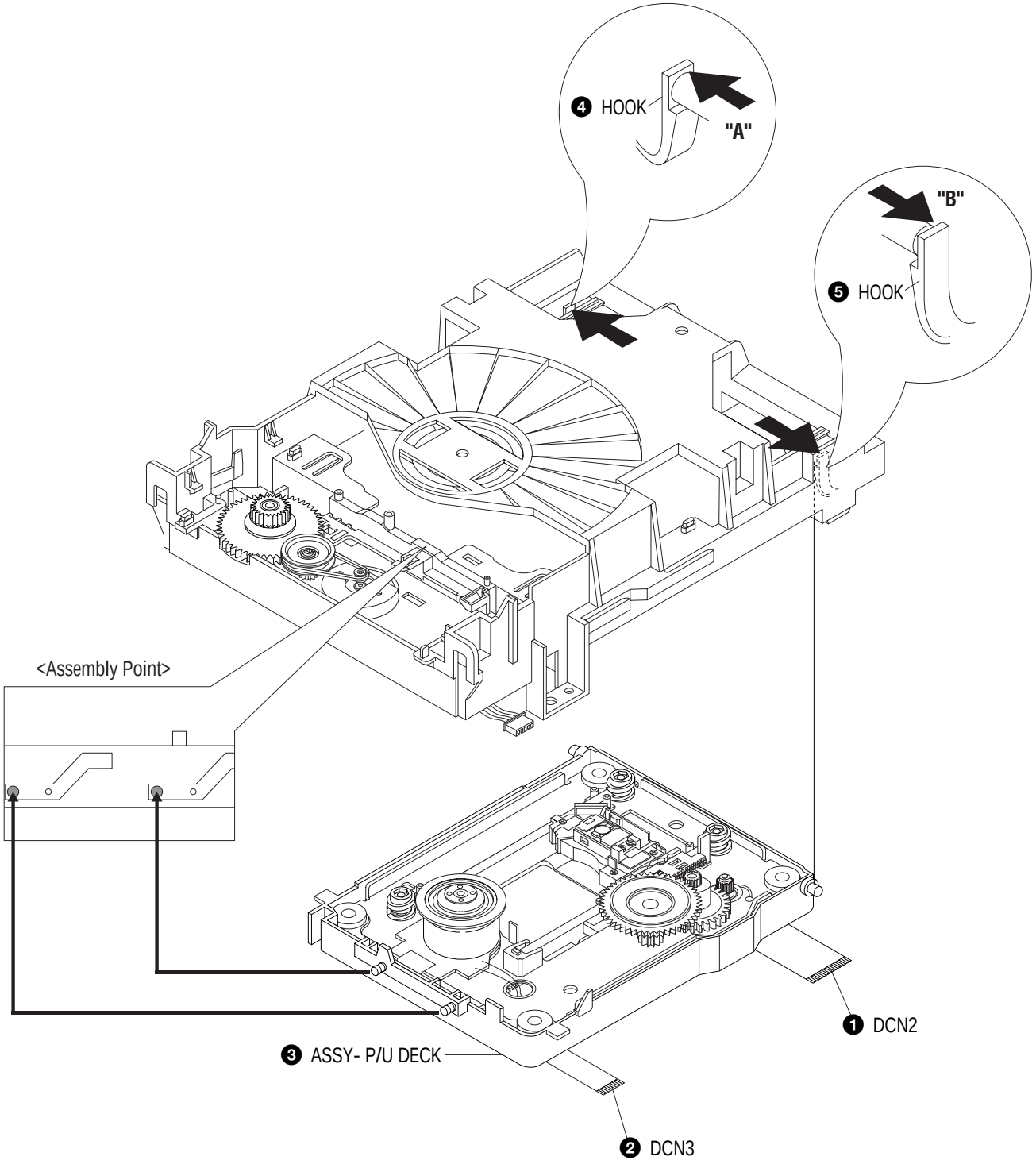


Fig. 2-45 Assy P/U Deck Removal

2-6-3 Housing Ass'y Removal

1) Remove Belt ❶.
2) Push the Hook ❷ in the direction arrow "A" and lift up Pulley Gear ❸.
3) Push the Slider Housing ❺ in the direction arrow "B" and lift up the Gear Tray ❹.
4) Lift up the Slider Housing ❺.
5) Remove 2 Screws ❻ and lift down the Motor Load Assy ❼.
6) Remove Clamper Ass'y ❽.

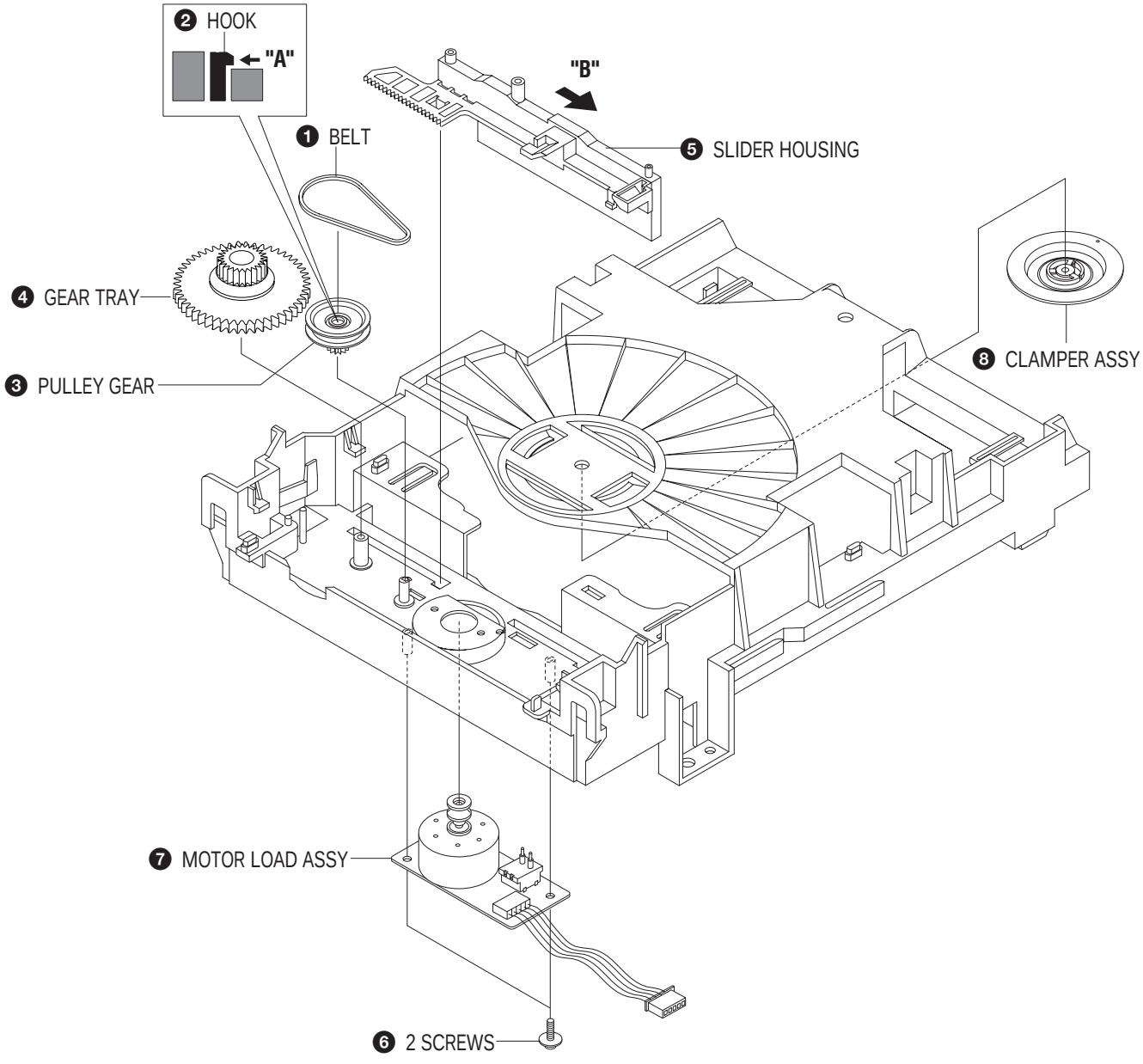


Fig. 2-46 Housing Ass'y Removal

2-6-4 Sub Chassis Removal

1) Remove the Soldering of Motor Feed (+, - wire) ❶.
2) Remove the 4 Screws ❷.
3) Lift up the Ass'y Brkt Deck ❸.

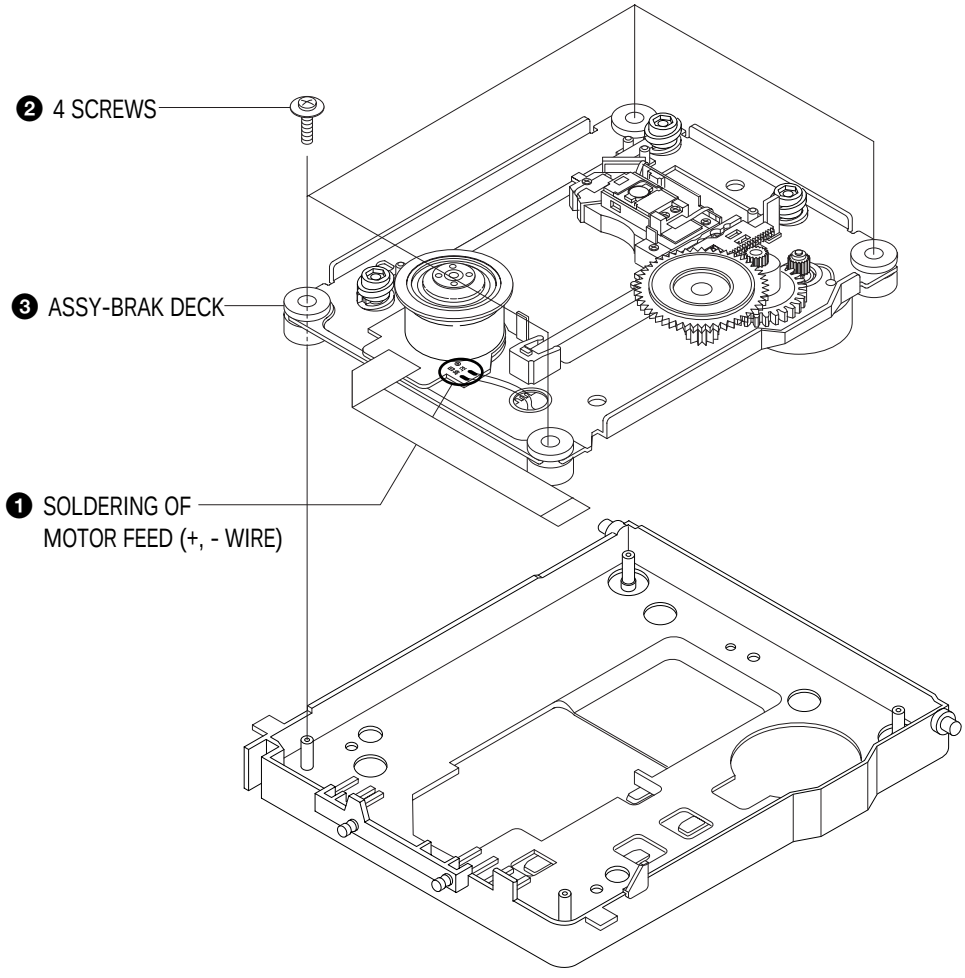


Fig. 2-47 Sub Chassis Removal

2-6-5 Ass'y Brkt Deck Removal

1) Push the Hook ❶ in the direction arrow "A" and lift up Gear Feed B ❷.
2) Remove 3 Screws ❸ and 3 Holder Cam Skew ❹.
3) Remove Shaft Pick-Up ❺ and Pick-Up Assy ❻.
4) Remove Gear Feed A ❼.
5) Remove 2 Screws ❽.
6) Remove Motor Feed Ass'y ❾.
7) Remove 3 Screws ❿.
8) Remove Motor Spindle ⓫.

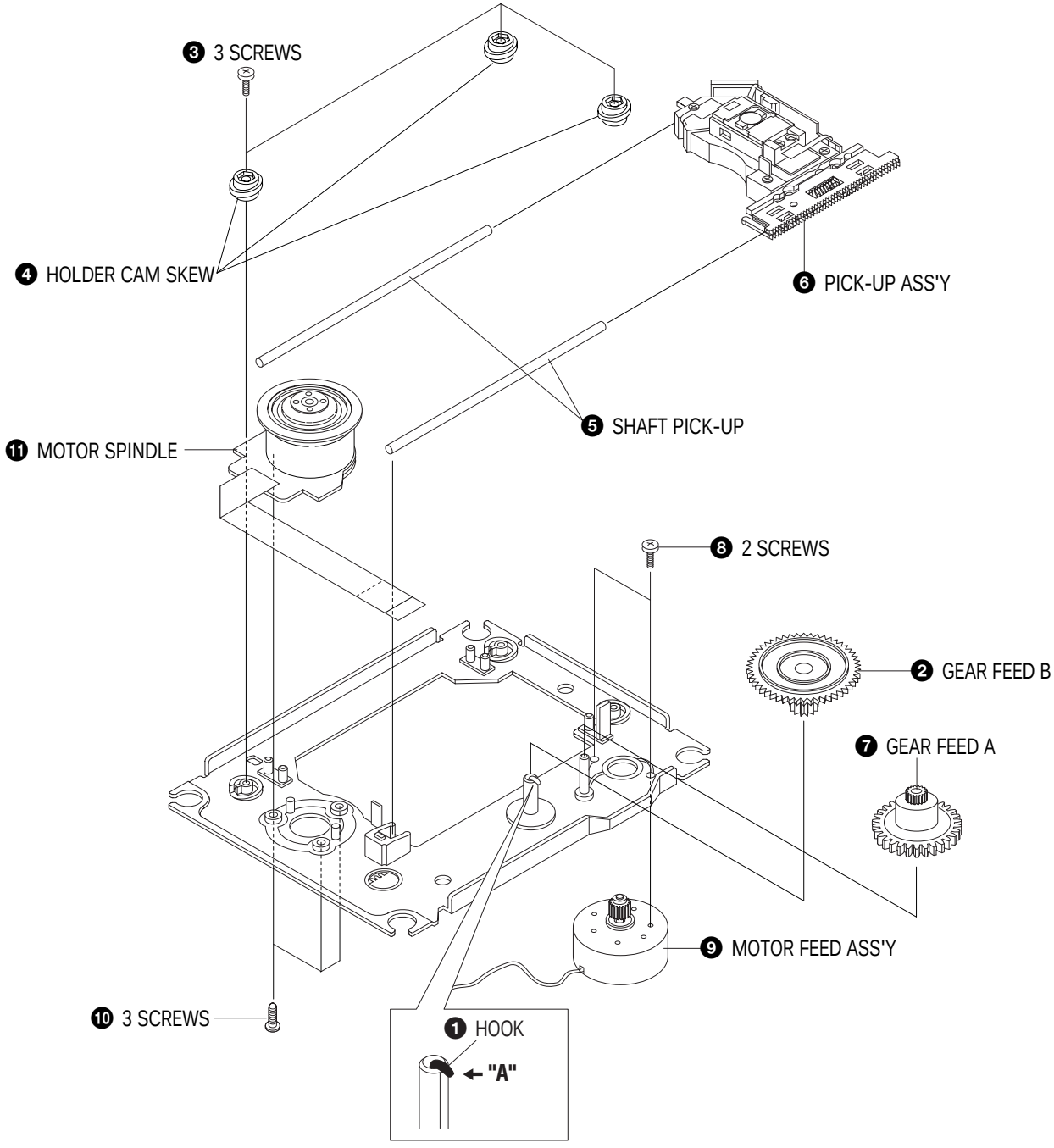
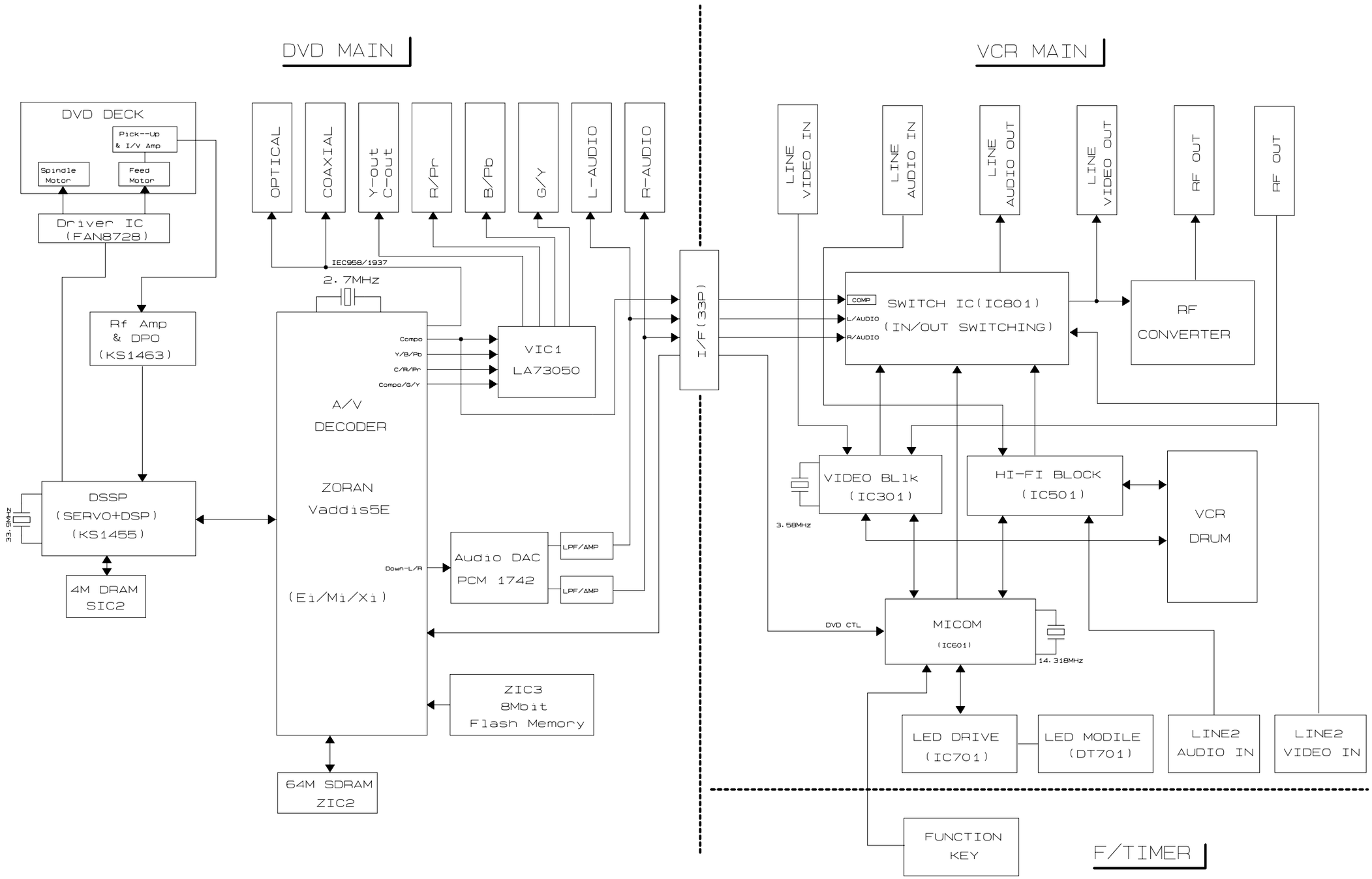


Fig. 2-48 Ass'y Brkt Deck Removal

3. BLOCK DIAGRAM



MEMO

4. PCB DIAGRAMS

4-1 VCR Main ---------- 4-3

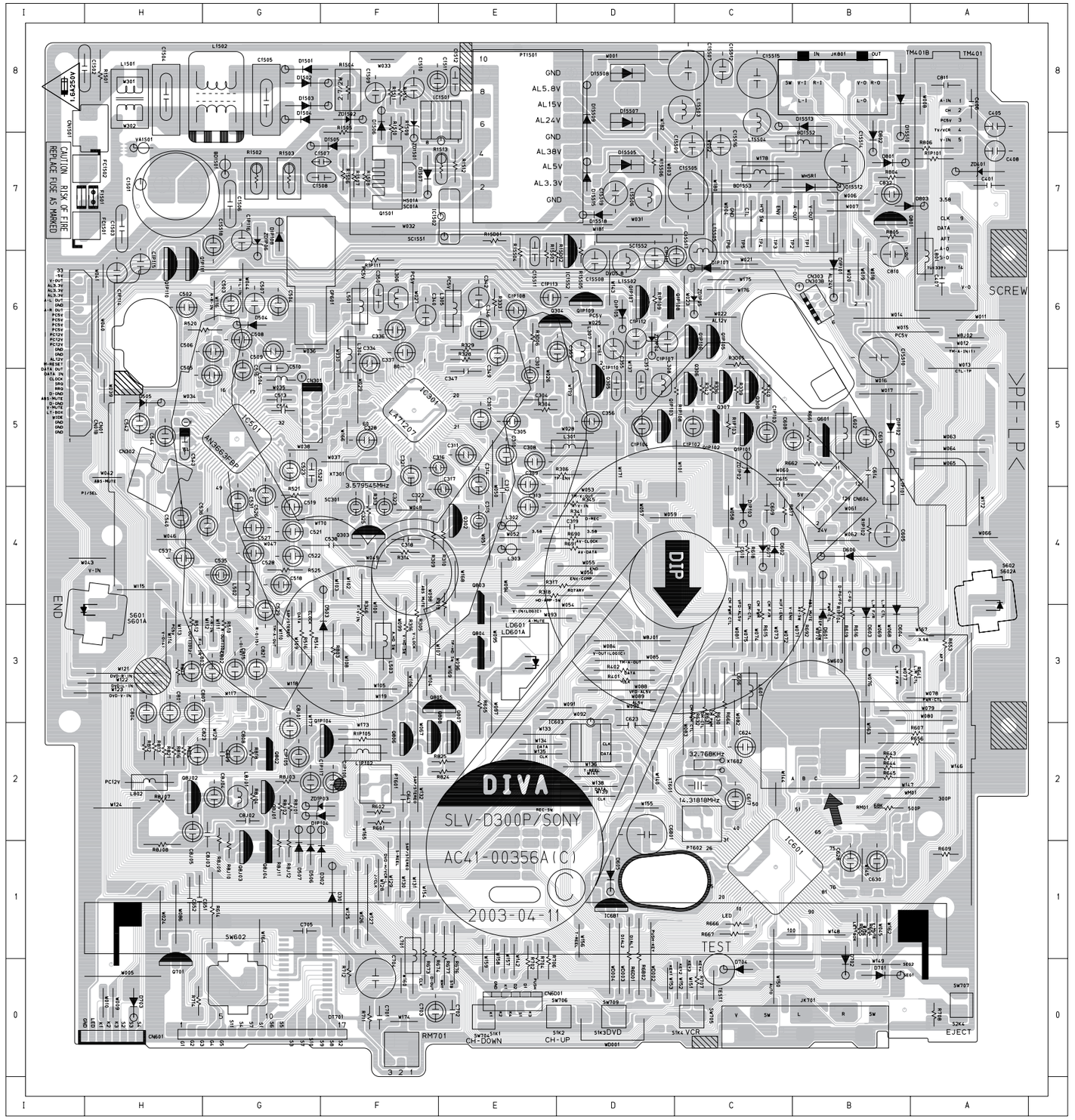
4-2 DVD Main ---------- 4-7

4-3 Function-Timer ---------- 4-9

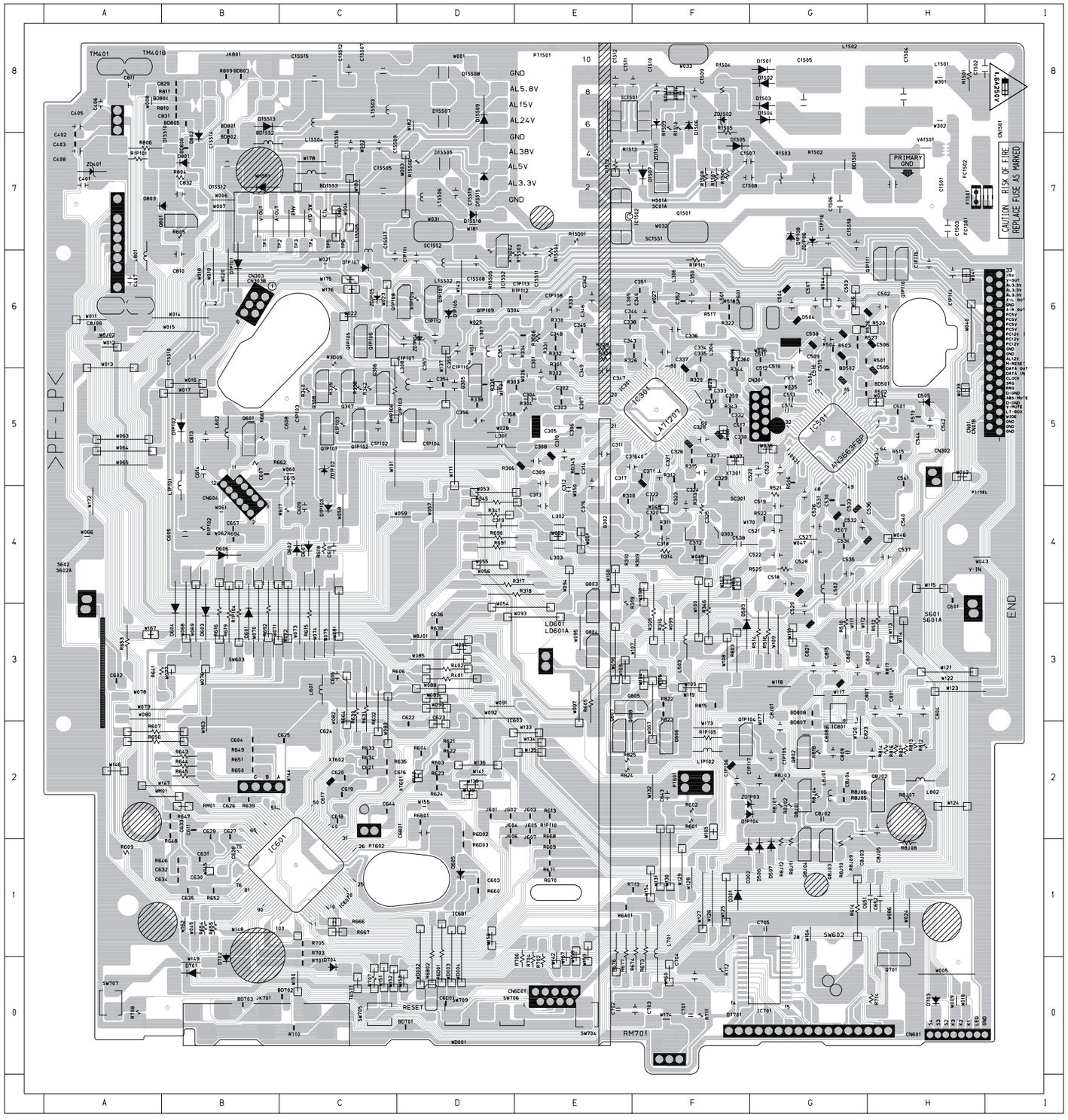
4-4 Dial-Timer ---------- 4-11

4-1 VCR MAIN

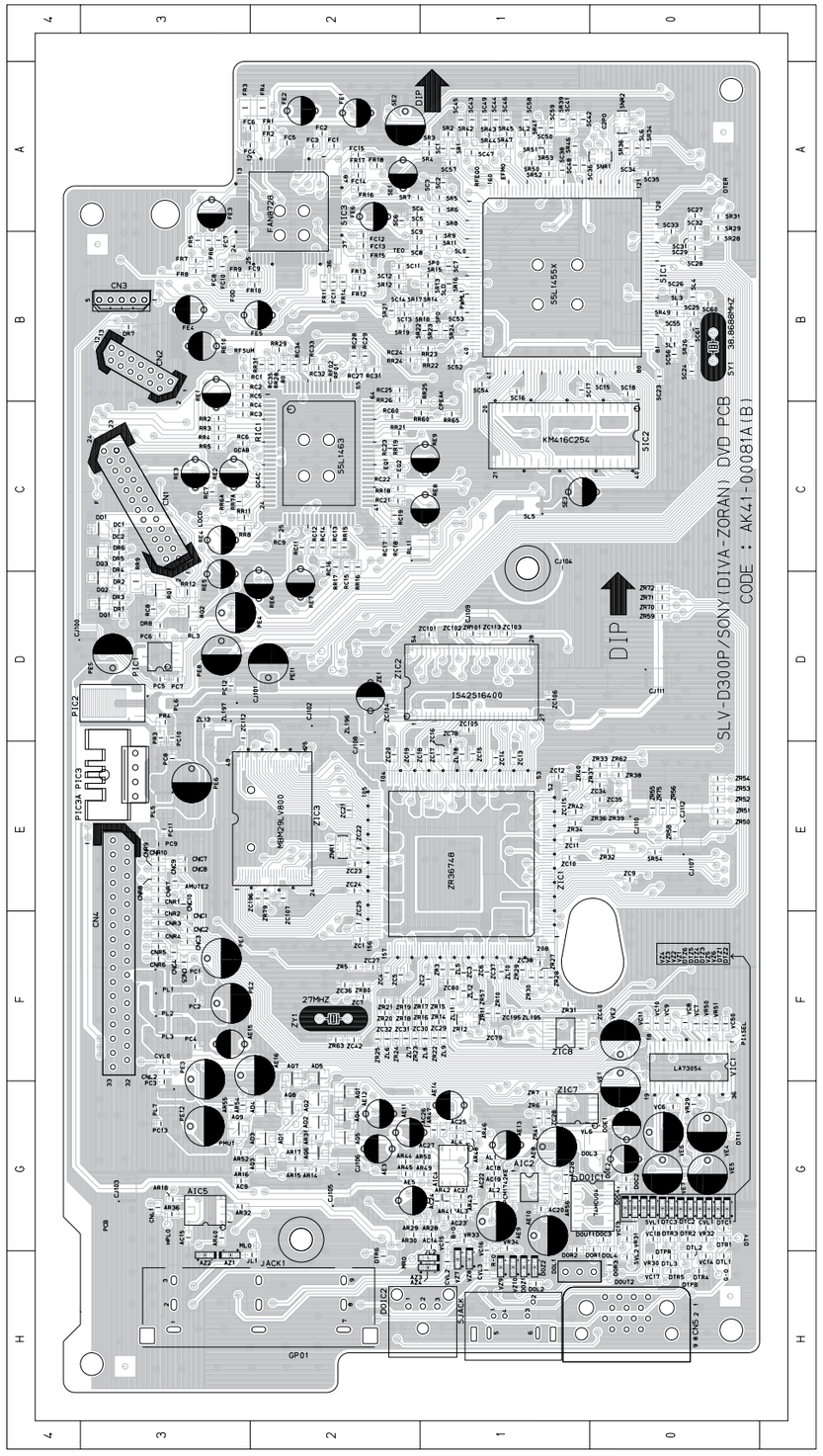
COMPONENT SIDE



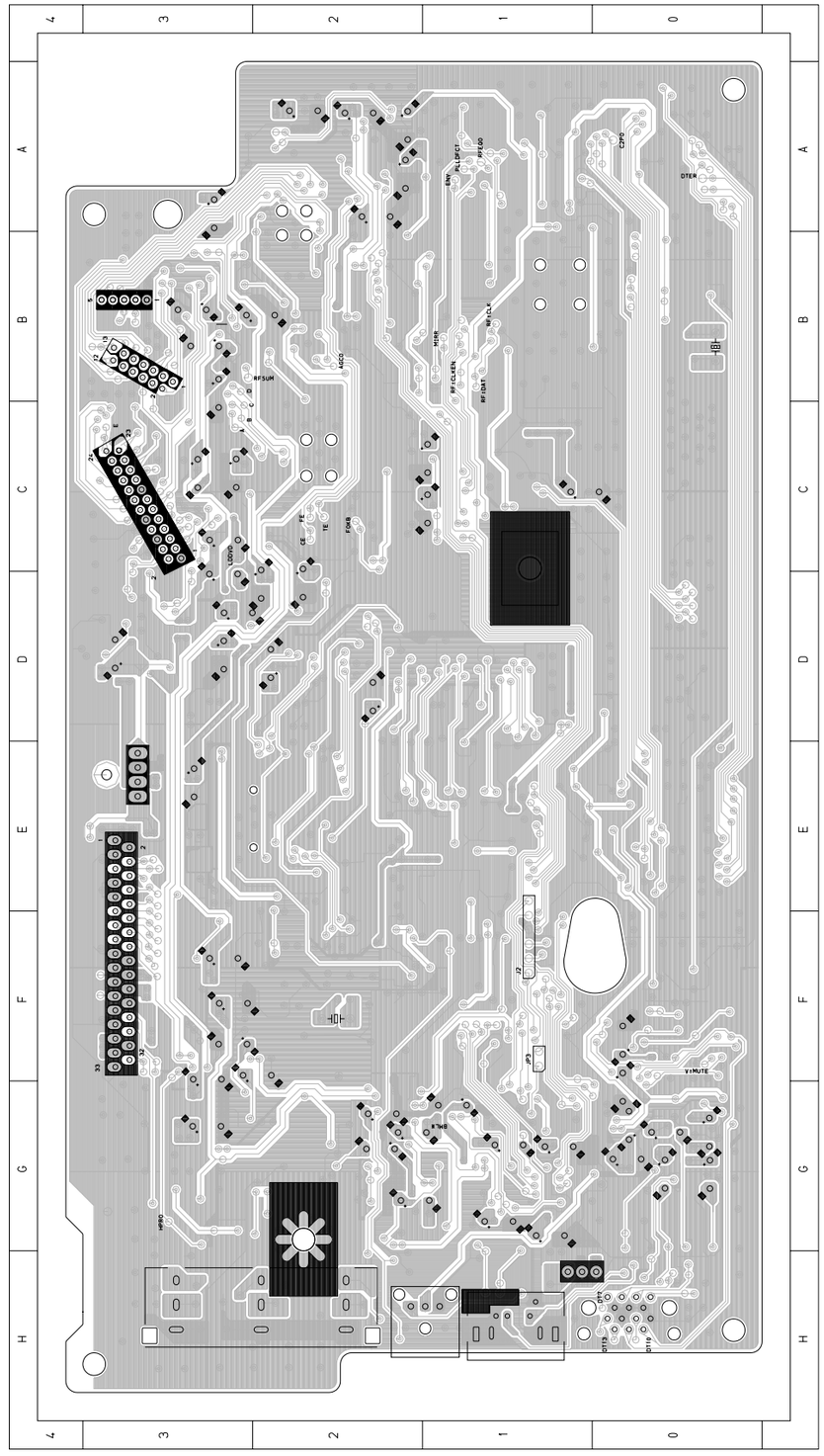
CONDUCTOR SIDE



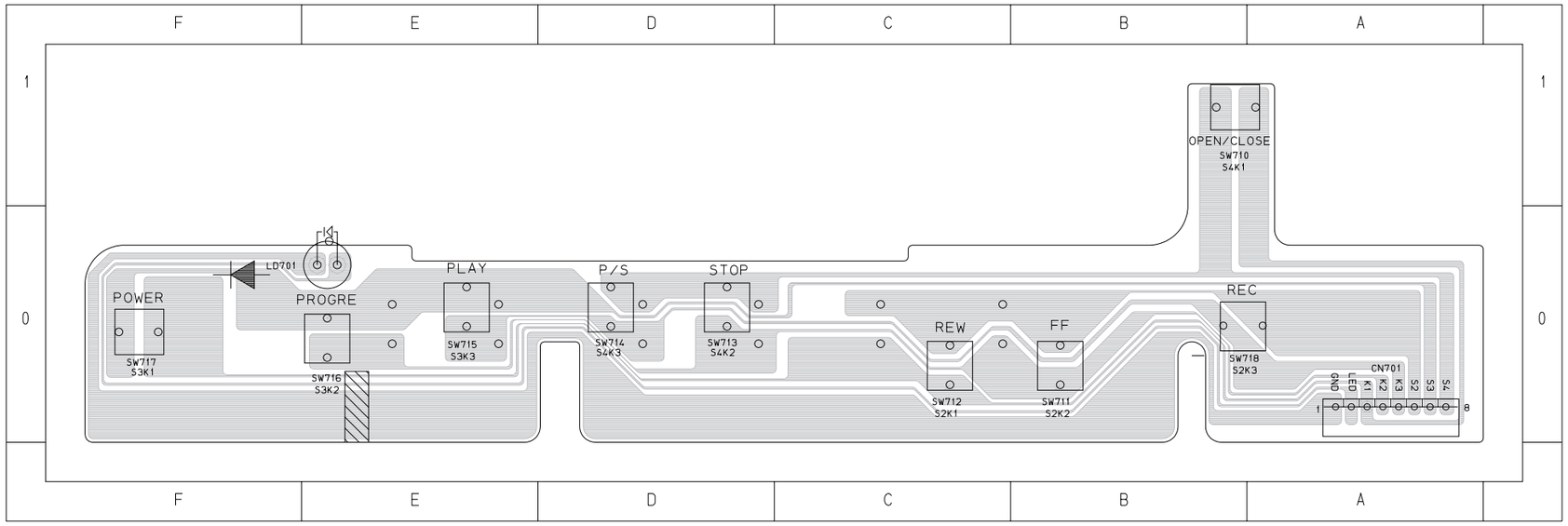
COMPONENT SIDE



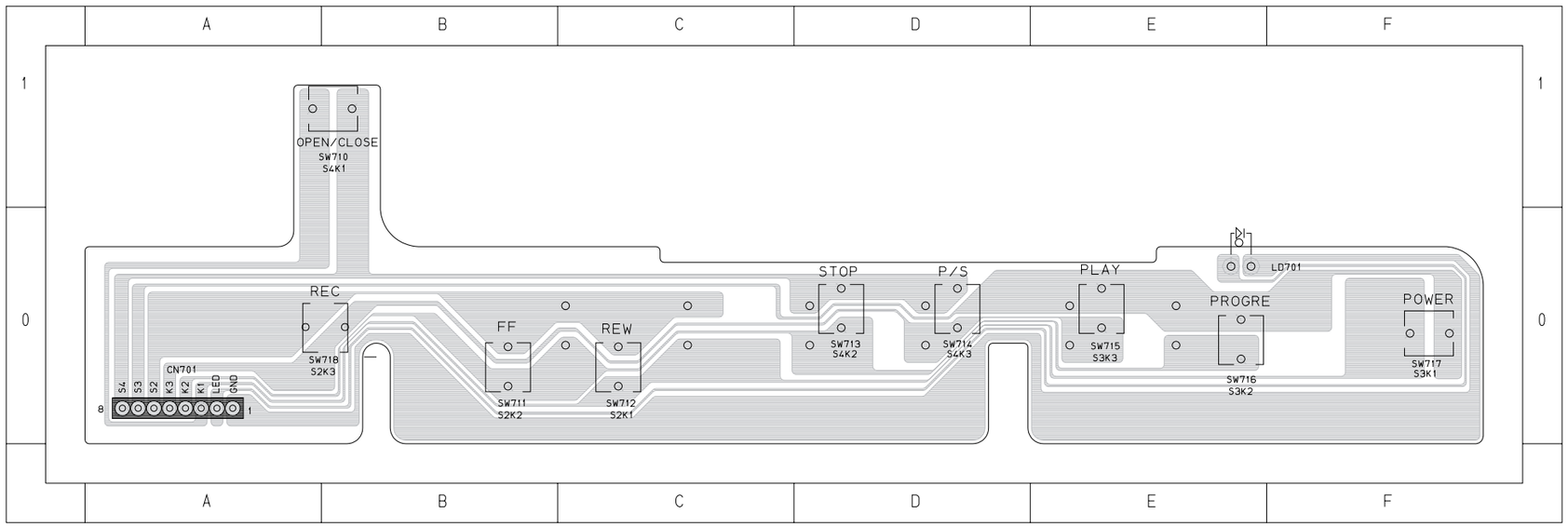
CONDUCTOR SIDE



COMPONENT SIDE

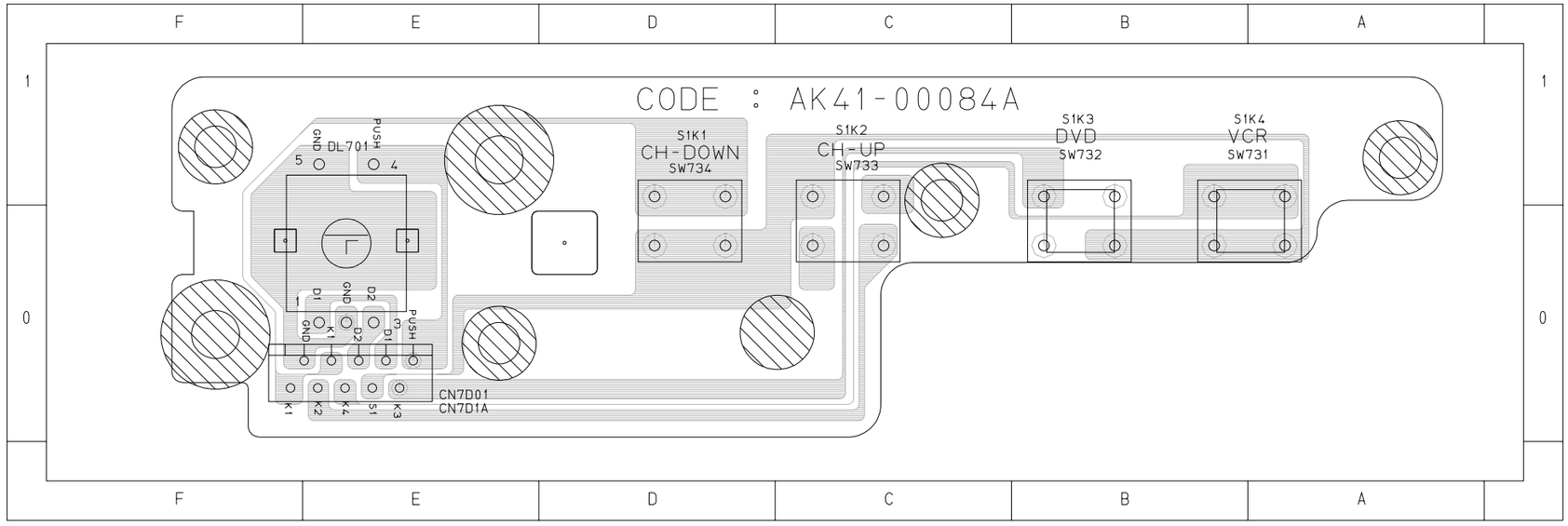


CONDUCTOR SIDE

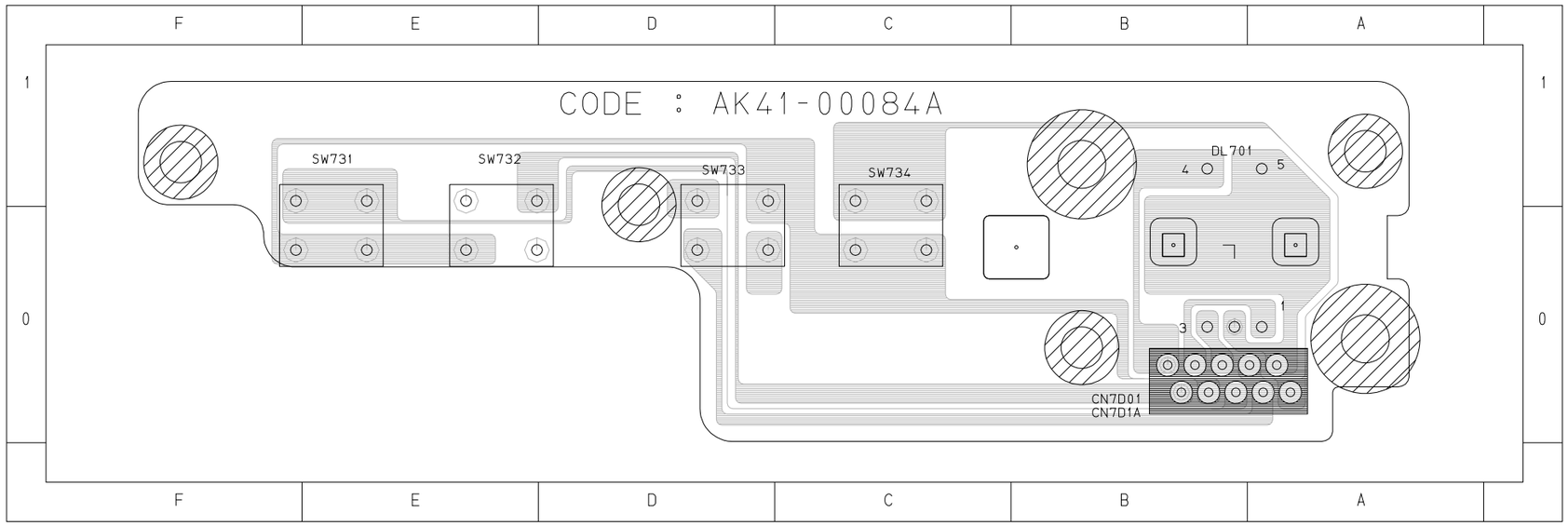


7-4 DIAL TIMER

COMPONENT SIDE



CONDUCTOR SIDE



5. SCHEMATIC DIAGRAMS

◆ Block Identification of Main PCB ---------- 5-3

VCR Main PCB

5-1 S.M.P.S. ---------- 5-5

5-2 Power Drive ---------- 5-7

5-3 Logic/Function-Time ---------- 5-9

5-4 Audio/Video ---------- 5-11

5-5 Hi-Fi/MTS ---------- 5-13

5-6 Input-Output ---------- 5-15

DVD Main PCB

5-7 DVD Main-Micom/AV Decoder ---------- 5-17

5-8 DVD Servo ---------- 5-19

5-9 DVD Audio/Video ---------- 5-21

Note

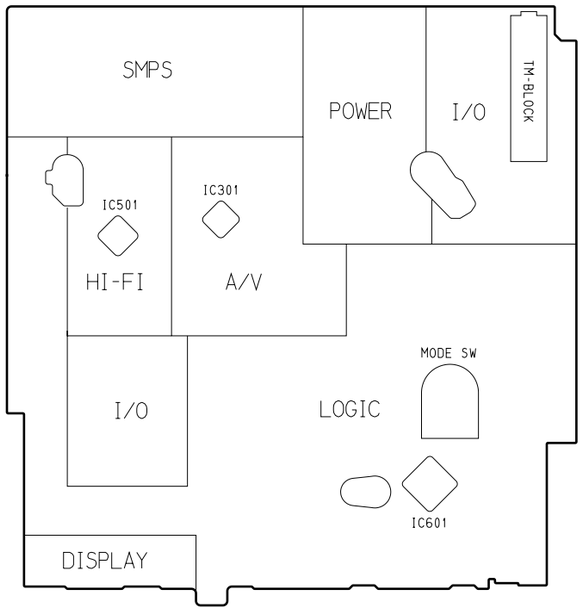
For schematic Diagram
- Resistors are in ohms, 1/8W unless otherwise noted.

Special note :
Most semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "electrostatically sensitive (ES) devices" section of this service manual.

Important safety notices :
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components.
Use only the same type.

◆ BLOCK IDENTIFICATION OF MAIN PCB

VCR MAIN PCB



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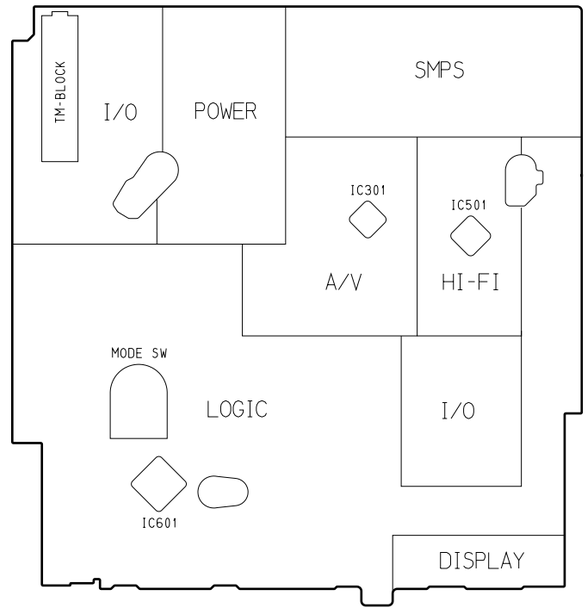
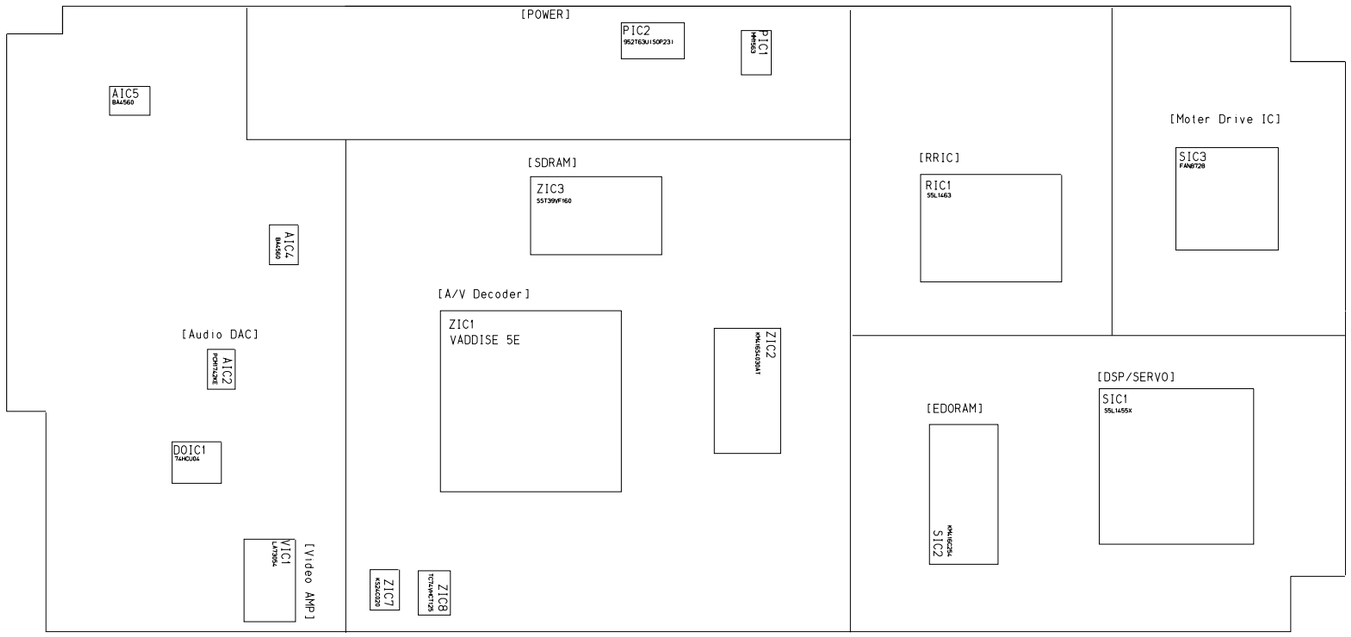
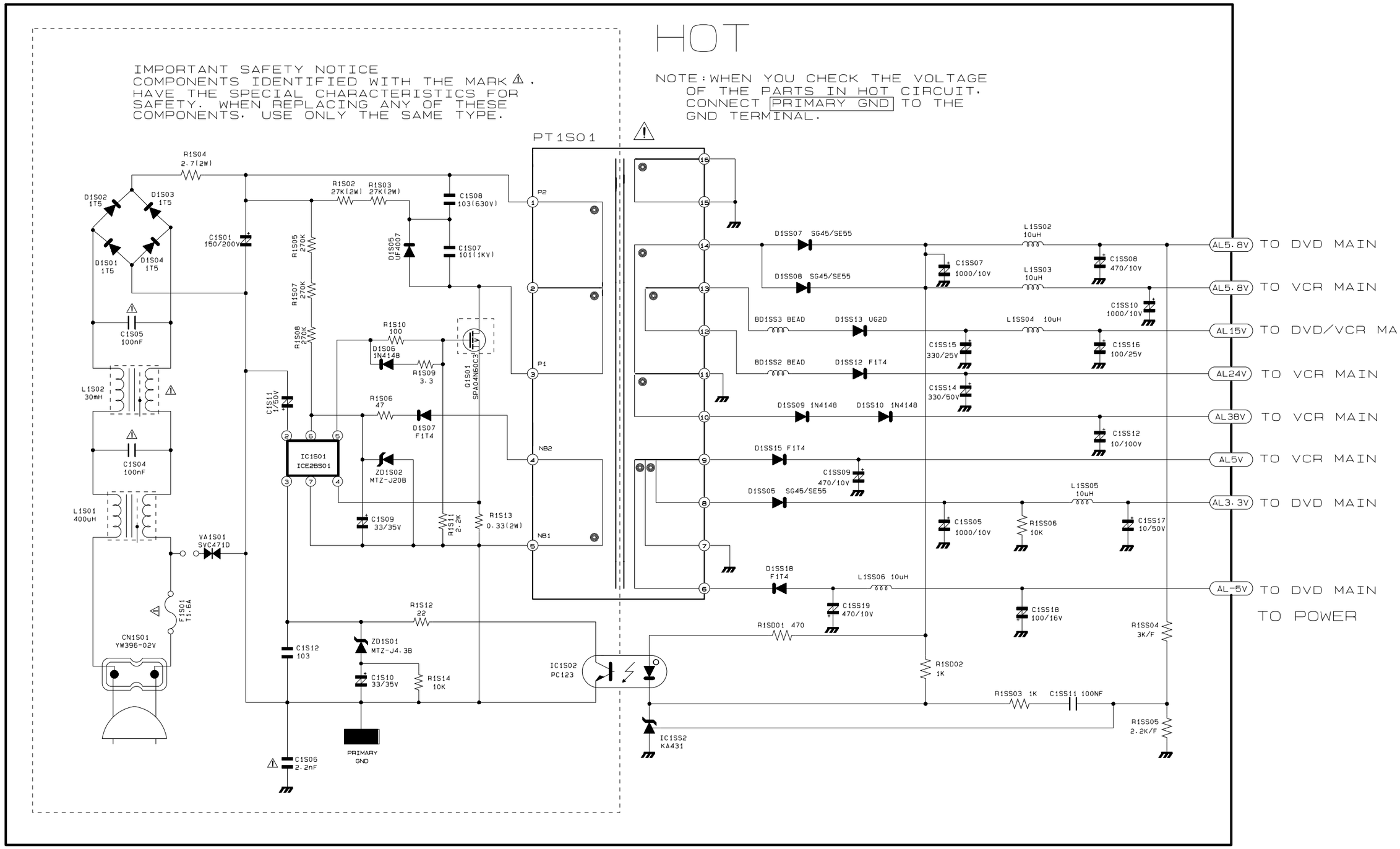


<Conductor Side>

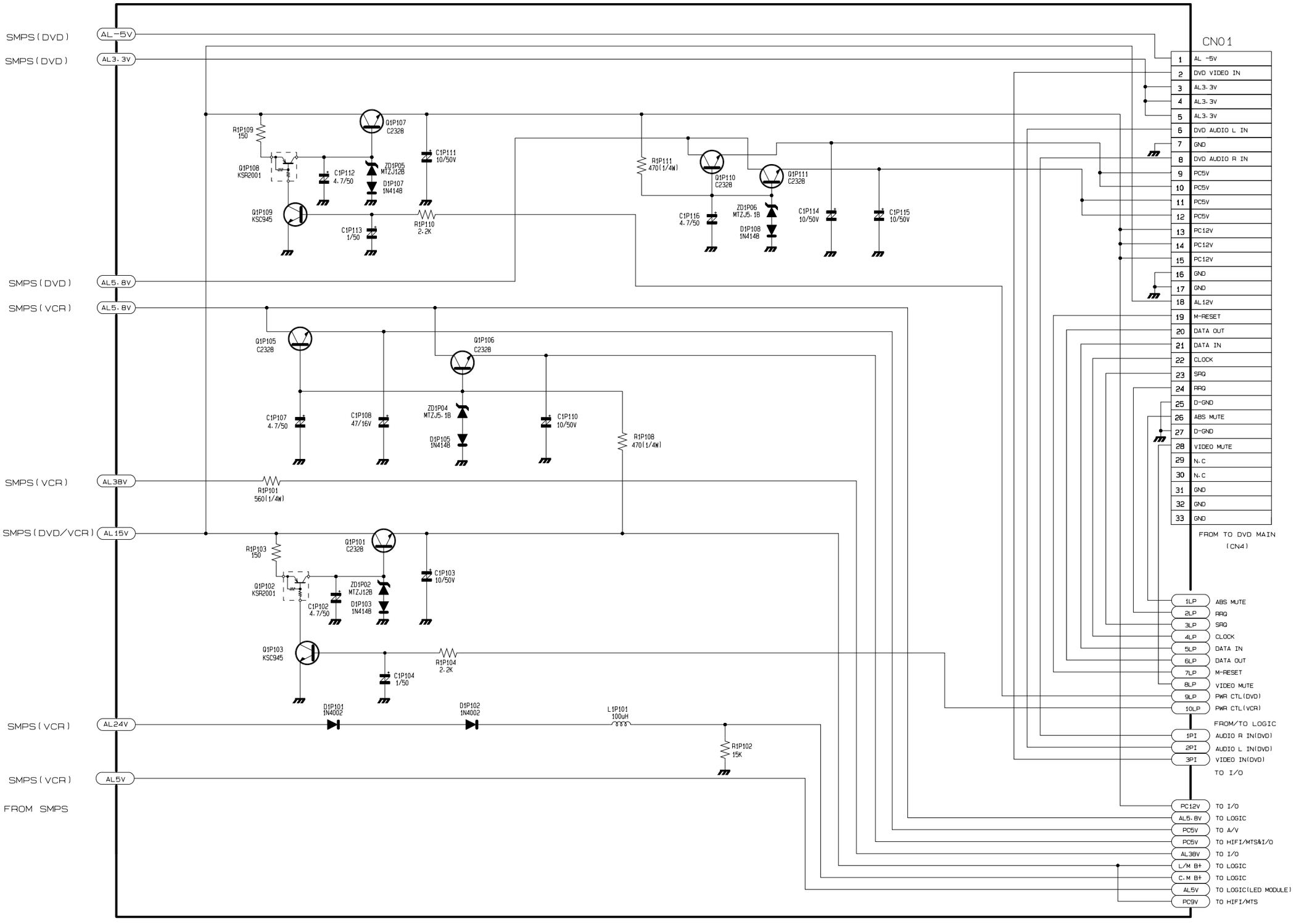
DVD MAIN PCB



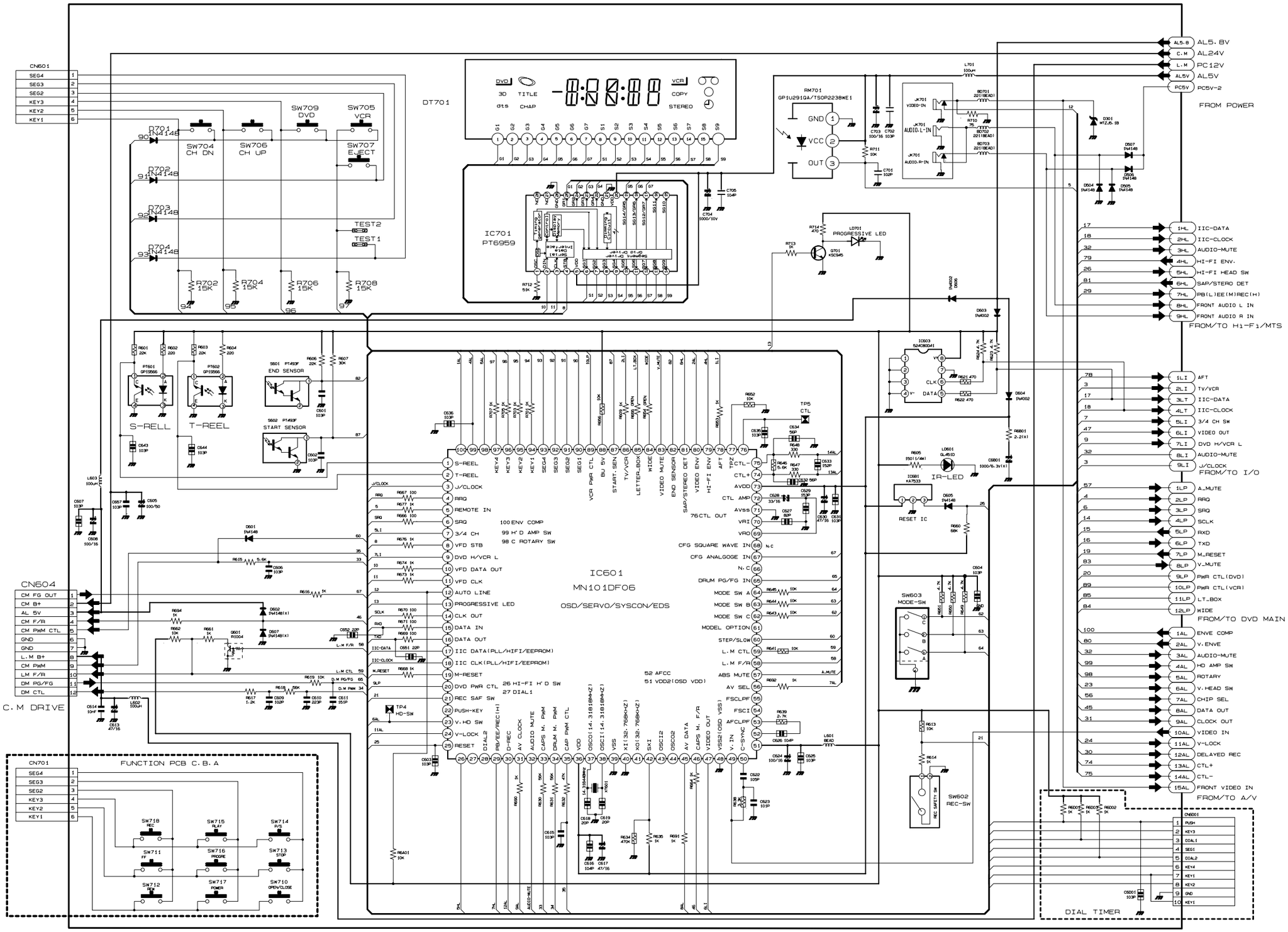
<Component Side>

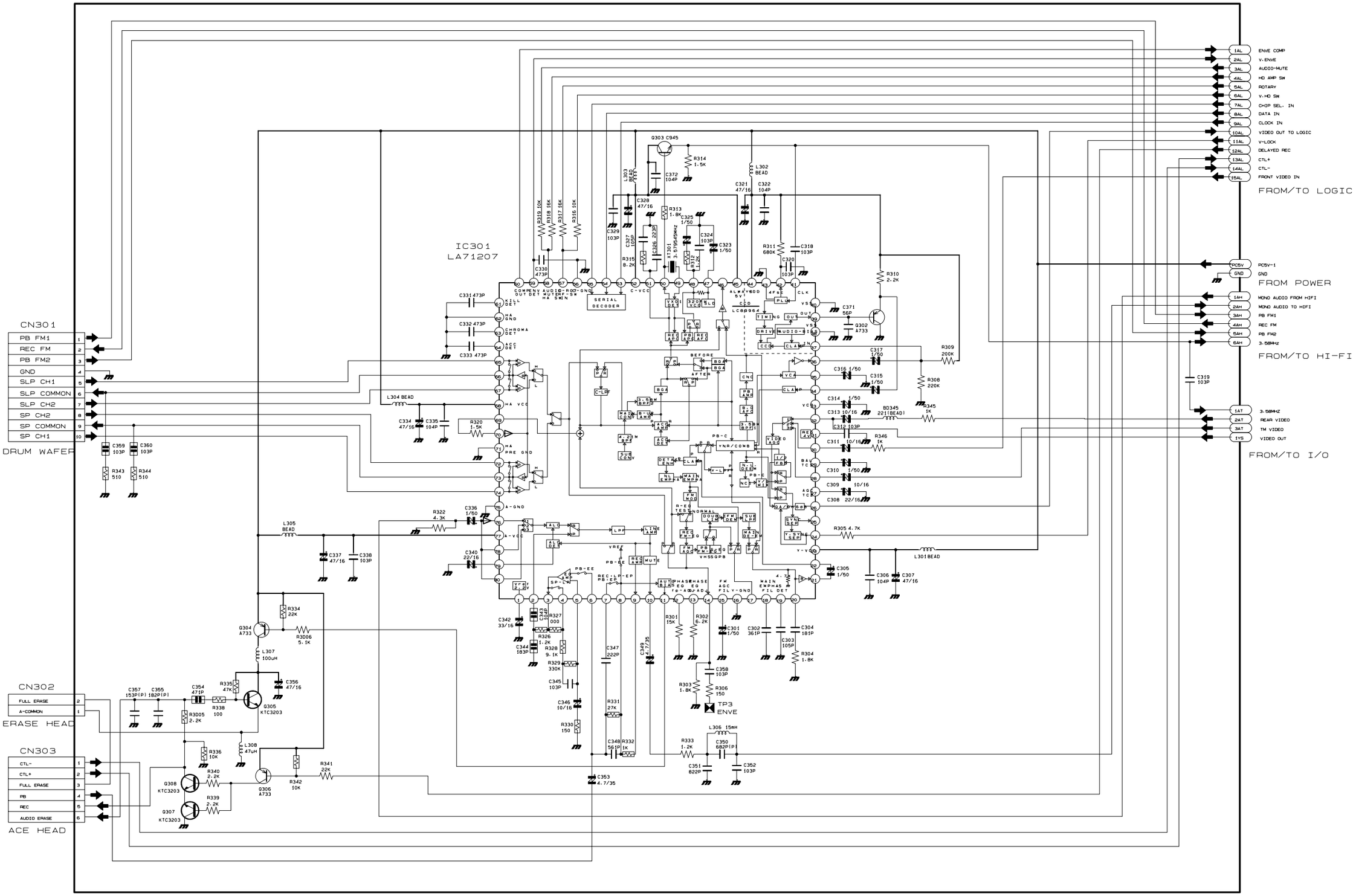

HOT
IMPORTANT SAFETY NOTICE
COMPONENTS IDENTIFIED WITH THE MARK ⚠.
HAVE THE SPECIAL CHARACTERISTICS FOR
SAFETY. WHEN REPLACING ANY OF THESE
COMPONENTS. USE ONLY THE SAME TYPE.
NOTE:WHEN YOU CHECK THE VOLTAGE
OF THE PARTS IN HOT CIRCUIT.
CONNECT PRIMARY GND TO THE
GND TERMINAL.
PT1S01
R1S04 2.7(2W)
D1S02 1T5
D1S03 1T5
D1S01 1T5
D1S04 1T5
C1S01 150/200V
R1S02 27K(2W)
R1S03 27K(2W)
C1S08 103(630V)
C1S07 101(1KV)
D1S05 UF4007
R1S05 270K
R1S07 270K
R1S08 270K
C1S05 100nF
R1S10 100
D1S06 1N4148
R1S09 3.3
D1S01 SPA04N60C3
L1S02 30mH
C1S11 1/50V
R1S06 47
D1S07 F1T4
C1S04 100nF
IC1S01 ICE2B501
ZD1S02 MTZ-J20B
C1S09 33/35V
R1S11 2.2K
R1S13 0.33(2W)
L1S01 400uH
VA1S01 SVC471D
F1S01 T1.6A
CN1S01 YW396-02V
R1S12 22
C1S12 103
ZD1S01 MTZ-J4.3B
C1S10 33/35V
R1S14 10K
C1S06 2.2nF
PRIMARY GND
IC1S02 PC123
P2
P1
NB2
NB1
D1SS07 SG45/SE55
D1SS08 SG45/SE55
BD1SS3 BEAD
D1SS13 UG2D
BD1SS2 BEAD
D1SS12 F1T4
D1SS09 1N4148
D1SS10 1N4148
D1SS15 F1T4
D1SS05 SG45/SE55
D1SS18 F1T4
L1SS02 10uH
L1SS03 10uH
L1SS04 10uH
L1SS05 10uH
L1SS06 10uH
C1SS07 1000/10V
C1SS08 470/10V
C1SS10 1000/10V
C1SS15 330/25V
C1SS16 100/25V
C1SS14 330/50V
C1SS12 10/100V
C1SS09 470/10V
C1SS05 1000/10V
R1SS06 10K
C1SS17 10/50V
C1SS19 470/10V
C1SS18 100/16V
R1SD01 470
R1SD02 1K
R1SS04 3K/F
R1SS03 1K
C1SS11 100NF
R1SS05 2.2K/F
IC1S02 KA431
AL5.8V TO DVD MAIN
AL5.8V TO VCR MAIN
AL15V TO DVD/VCR MAIN
AL24V TO VCR MAIN
AL38V TO VCR MAIN
AL5V TO VCR MAIN
AL3.3V TO DVD MAIN
AL-5V TO DVD MAIN
TO POWER

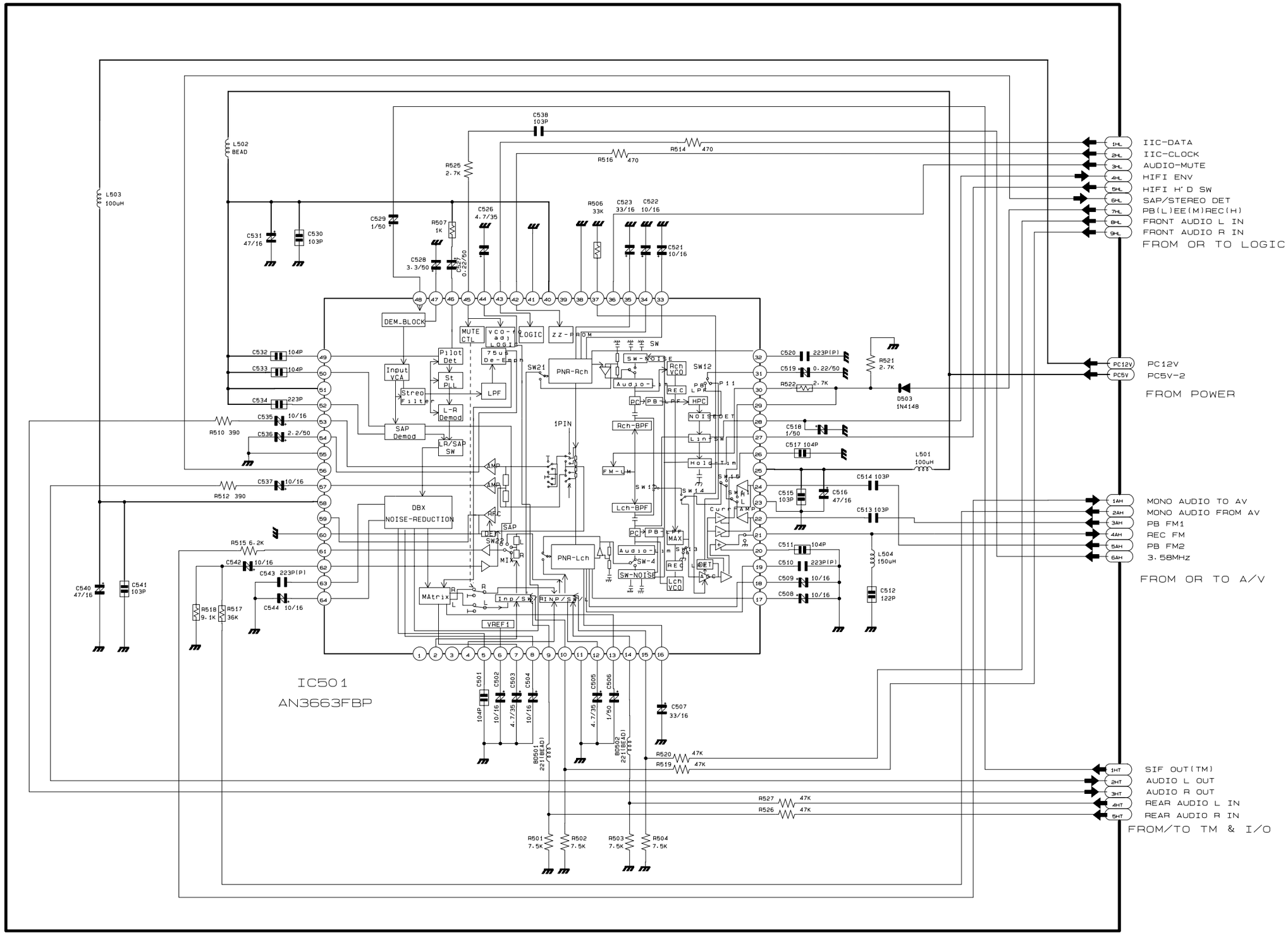
5-2 POWER DRIVE

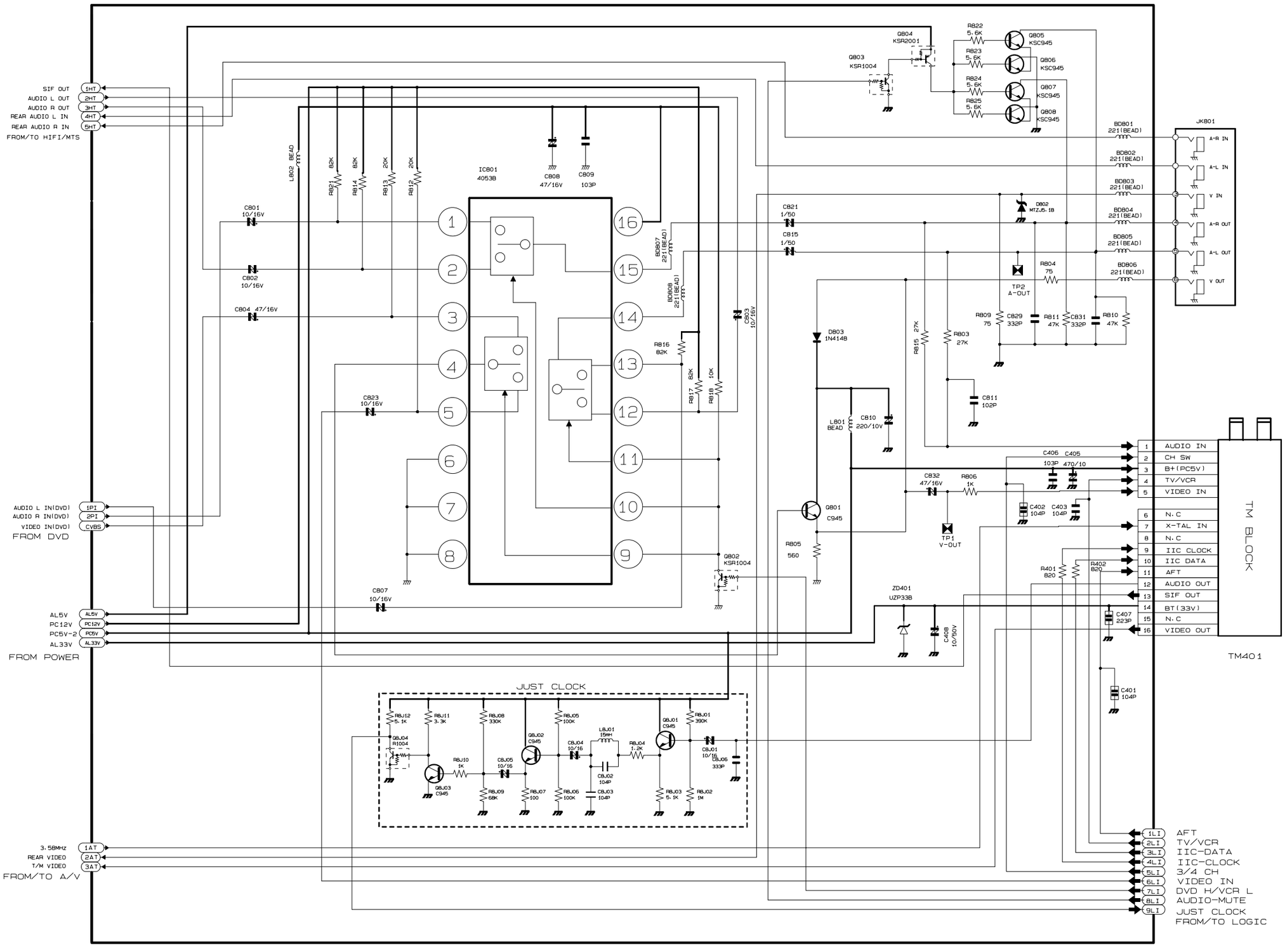


5-3 LOGIC/FUNCTION-TIMER

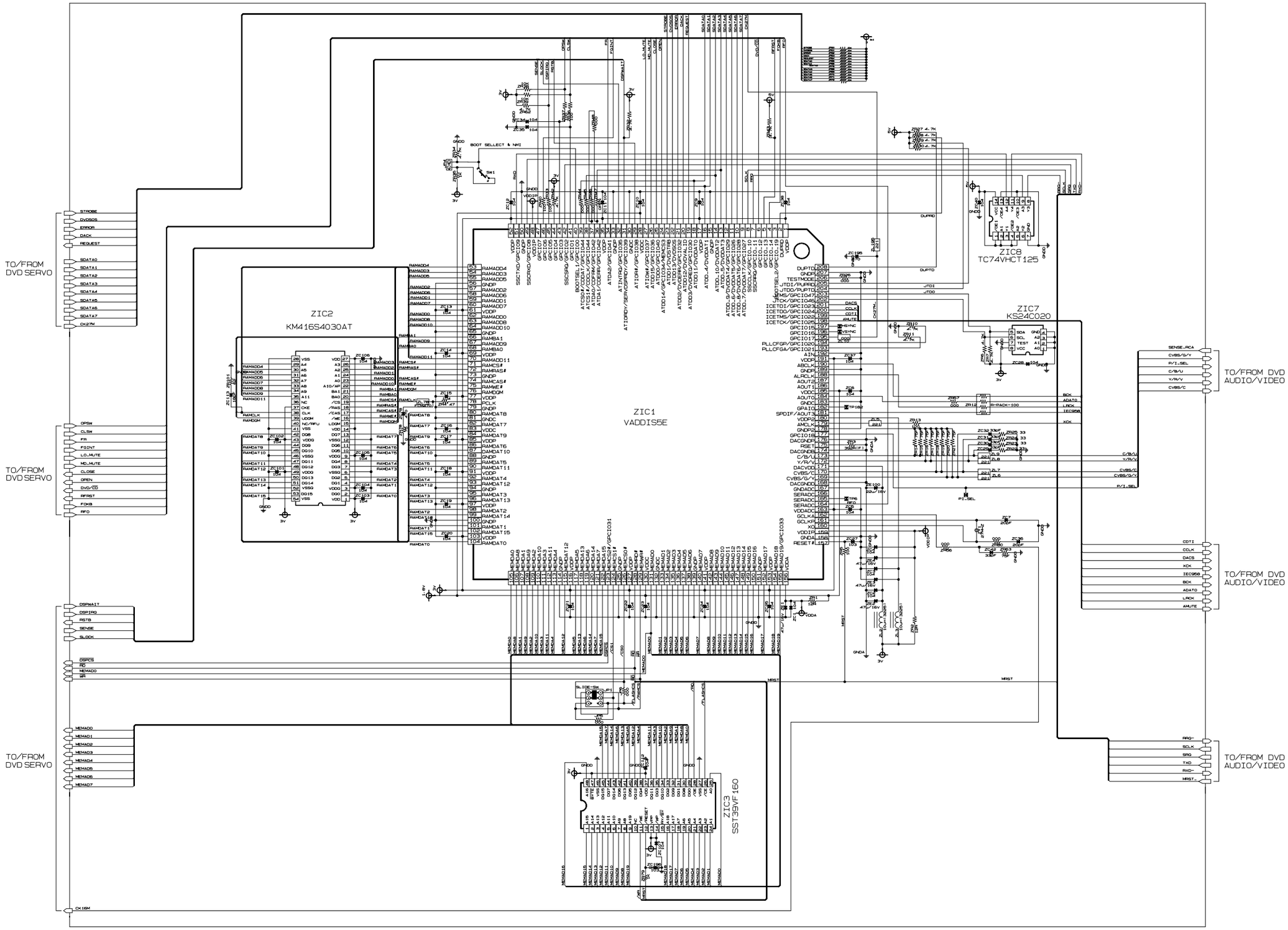


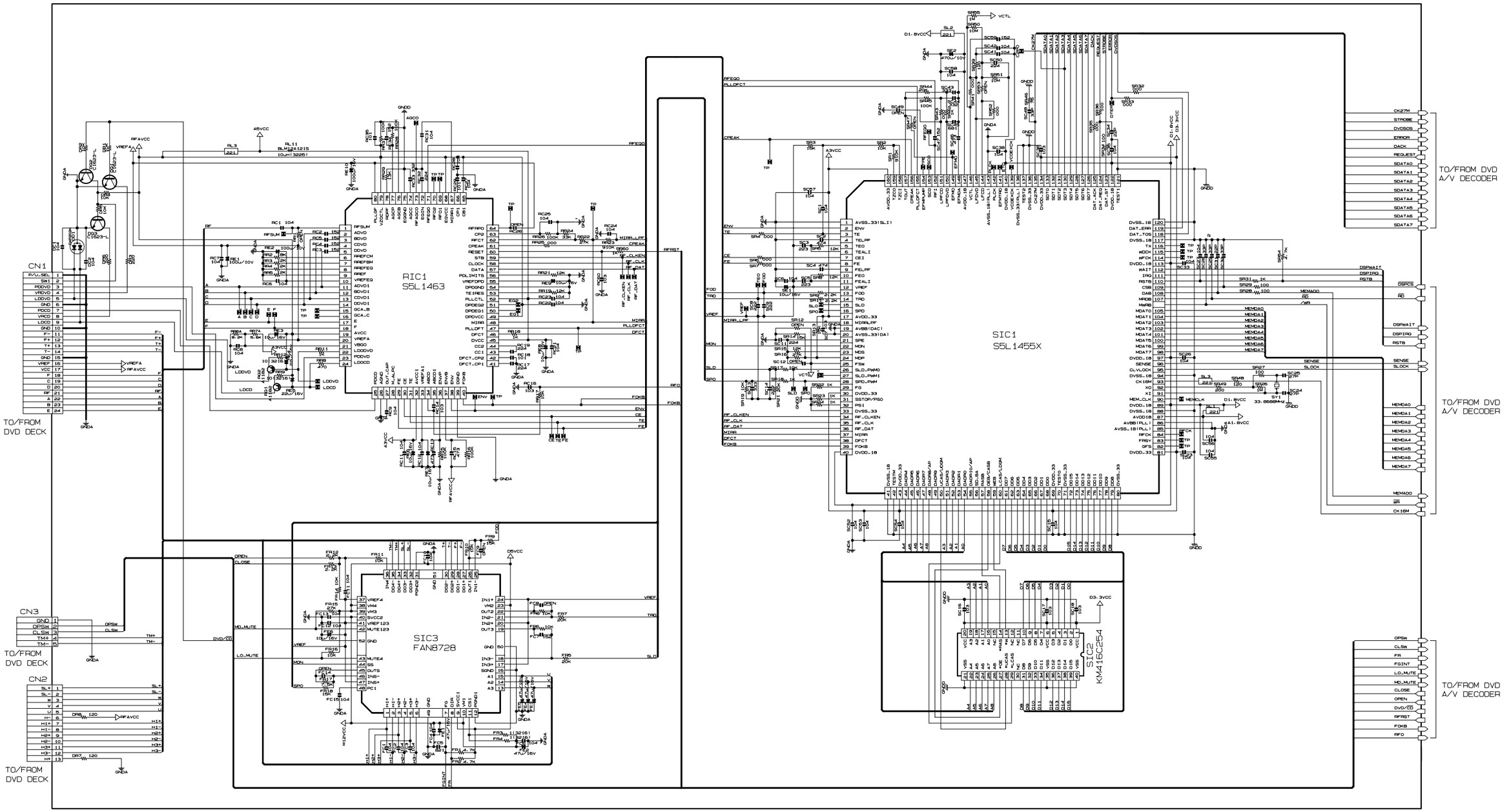

IC301
LA71207
CN301
PB FM1
REC FM
PB FM2
GND
SLP CH1
SLP COMMON
SLP CH2
SP CH2
SP COMMON
SP CH1
DRUM WAFER
CN302
FULL ERASE
A-COMMON
ERASE HEAD
CN303
CTL-
CTL+
FULL ERASE
PB
REC
AUDIO ERASE
ACE HEAD
1AL ENVE COMP
2AL V-ENVE
3AL AUDIO-MUTE
4AL HD AMP SW
5AL ROTARY
6AL V-HD SW
7AL CHIP SEL. IN
8AL DATA IN
9AL CLOCK IN
10AL VIDEO OUT TO LOGIC
11AL V-LOCK
12AL DELAYED REC
13AL CTL+
14AL CTL-
15AL FRONT VIDEO IN
FROM/TO LOGIC
PC5V PC5V-1
GND GND
FROM POWER
1AH MONO AUDIO FROM HIFI
2AH MONO AUDIO TO HIFI
3AH PB FM1
4AH REC FM
5AH PB FM2
6AH 3.58MHz
FROM/TO HI-FI
1AT 3.58MHZ
2AT REAR VIDEO
3AT TM VIDEO
1YS VIDEO OUT
FROM/TO I/O


IC501
AN3663FBP
IIC-DATA
IIC-CLOCK
AUDIO-MUTE
HIFI ENV
HIFI H'D SW
SAP/STEREO DET
PB(L)EE(M)REC(H)
FRONT AUDIO L IN
FRONT AUDIO R IN
FROM OR TO LOGIC
PC12V
PC5V-2
FROM POWER
MONO AUDIO TO AV
MONO AUDIO FROM AV
PB FM1
REC FM
PB FM2
3.58MHz
FROM OR TO A/V
SIF OUT(TM)
AUDIO L OUT
AUDIO R OUT
REAR AUDIO L IN
REAR AUDIO R IN
FROM/TO TM & I/O

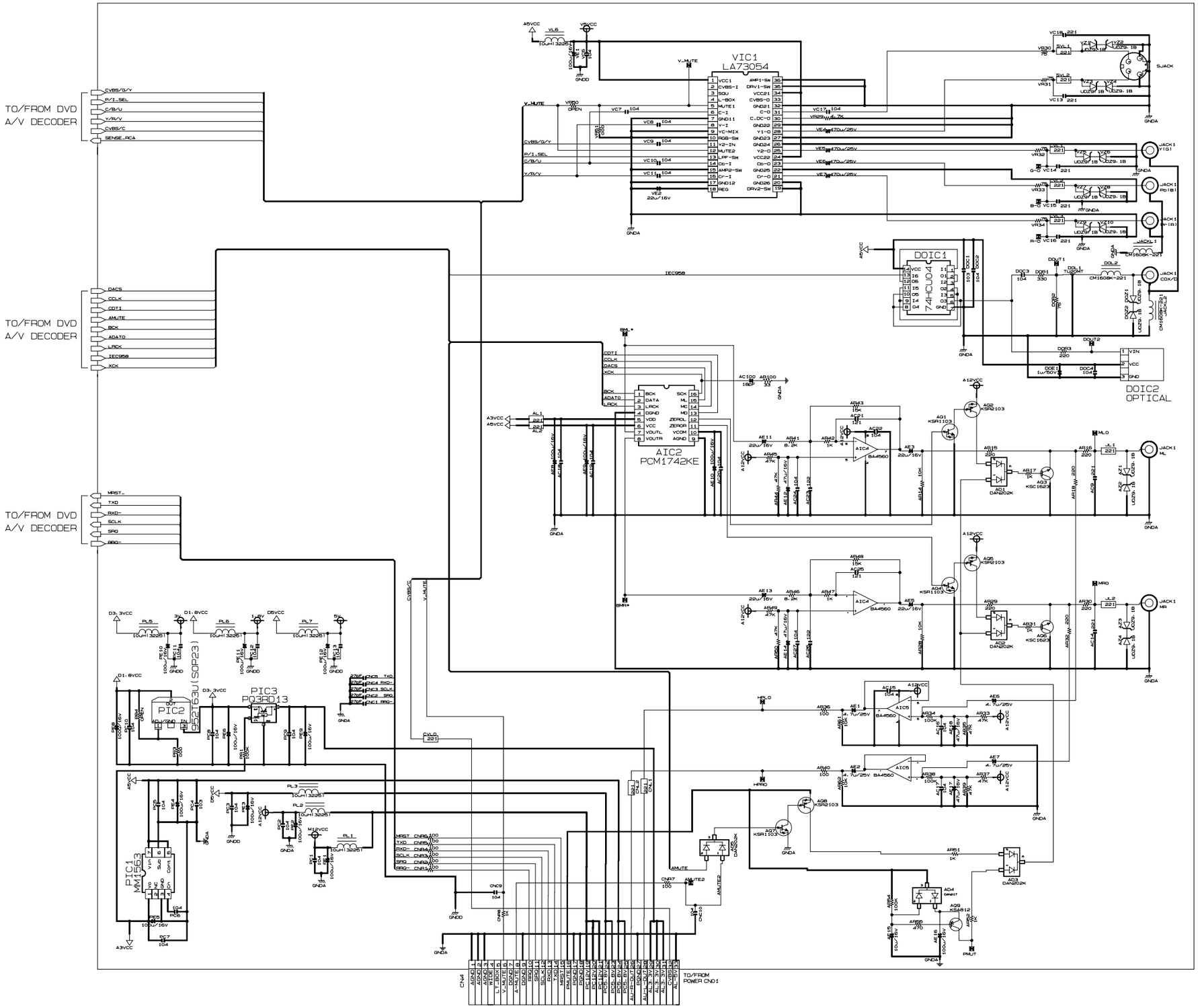

SIF OUT
AUDIO L OUT
AUDIO R OUT
REAR AUDIO L IN
REAR AUDIO R IN
FROM/TO HIFI/MTS
1HT
2HT
3HT
4HT
5HT
AUDIO L IN(DVD)
AUDIO R IN(DVD)
VIDEO IN(DVD)
FROM DVD
1PI
2PI
CVBS
AL5V
PC12V
PC5V-2
AL33V
FROM POWER
3.58MHz
REAR VIDEO
T/M VIDEO
FROM/TO A/V
1AT
2AT
3AT
IC801
4053B
L802 BEAD
R821 82K
R814 82K
R813 20K
R812 20K
C808 47/16V
C809 103P
C801 10/16V
C802 10/16V
C804 47/16V
C823 10/16V
C807 10/16V
C803 10/16V
BD807 221(BEAD)
BD808 221(BEAD)
R816 82K
R817 82K
R818 10K
Q802 KSR1004
Q804 KSR2001
Q803 KSR1004
R822 5.6K
R823 5.6K
R824 5.6K
R825 5.6K
Q805 KSC945
Q806 KSC945
Q807 KSC945
Q808 KSC945
C821 1/50
C815 1/50
D802 MTZJ5.1B
TP2 A-OUT
R804 75
R809 75
C829 332P
R811 47K
C831 332P
R810 47K
D803 1N4148
R815 27K
R803 27K
C811 102P
L801 BEAD
C810 220/10V
Q801 C945
R805 560
C832 47/16V
R806 1K
TP1 V-OUT
C406 103P
C405 470/10
C402 104P
C403 104P
R401 820
R402 820
ZD401 UZP33B
C408 10/50V
C407 223P
C401 104P
BD801 221(BEAD)
BD802 221(BEAD)
BD803 221(BEAD)
BD804 221(BEAD)
BD805 221(BEAD)
BD806 221(BEAD)
JKB01
A-R IN
A-L IN
V IN
A-R OUT
A-L OUT
V OUT
TM BLOCK
TM401
1 AUDIO IN
2 CH SW
3 B+(PC5V)
4 TV/VCR
5 VIDEO IN
6 N.C
7 X-TAL IN
8 N.C
9 IIC CLOCK
10 IIC DATA
11 AFT
12 AUDIO OUT
13 SIF OUT
14 BT(33V)
15 N.C
16 VIDEO OUT
1LI AFT
2LI TV/VCR
3LI IIC-DATA
4LI IIC-CLOCK
5LI 3/4 CH
6LI VIDEO IN
7LI DVD H/VCR L
8LI AUDIO-MUTE
9LI JUST CLOCK
FROM/TO LOGIC
JUST CLOCK
RBJ12 5.1K
RBJ11 3.3K
RBJ08 330K
RBJ05 100K
QBJ02 C945
CBJ04 10/16
LBJ01 15MH
RBJ04 1.2K
QBJ01 C945
RBJ01 390K
CBJ01 10/16
CBJ06 333P
QBJ04 R1004
RBJ10 1K
CBJ05 10/16
QBJ03 C945
RBJ09 68K
RBJ07 100
RBJ06 100K
CBJ02 104P
CBJ03 104P
RBJ03 5.1K
RBJ02 1M

5-7 DVD MAIN-MICOM/AV DECODER




CN1
TO/FROM DVD DECK
RIC1 S5L1463
SIC1 S5L1455X
SIC2 KM416C254
SIC3 FAN8728
CN3
TO/FROM DVD DECK
CN2
TO/FROM DVD DECK
TO/FROM DVD A/V DECODER
TO/FROM DVD A/V DECODER
TO/FROM DVD A/V DECODER

5-9 DVD AUDIO/VIDEO



MEMO

6. ALIGNMENT AND ADJUSTMENTS

6-1 VCR ADJUSTMENT

6-1-1 Reference

1) X-Point (Tracking center) adjustment, “Head switching adjustment” can be adjusted with remote control.
2) When replacing the Main PCB Micom (IC601) be sure to adjust the “Head switching adjustment”.
3) When replacing the cylinder ass’y, be sure to adjust the “X-Point” and “Head switching adjustment”.
4) How to adjustment.
   - Intermittently short-circuit the Test Point on Main PCB with pincers to the adjustment mode.
   - If the corresponding adjustment button is pressed, the adjustment is performed automatically.
   - When the adjustment is completed, be sure to turn the power off.

6-1-1(a) Location of adjustment button of remote control

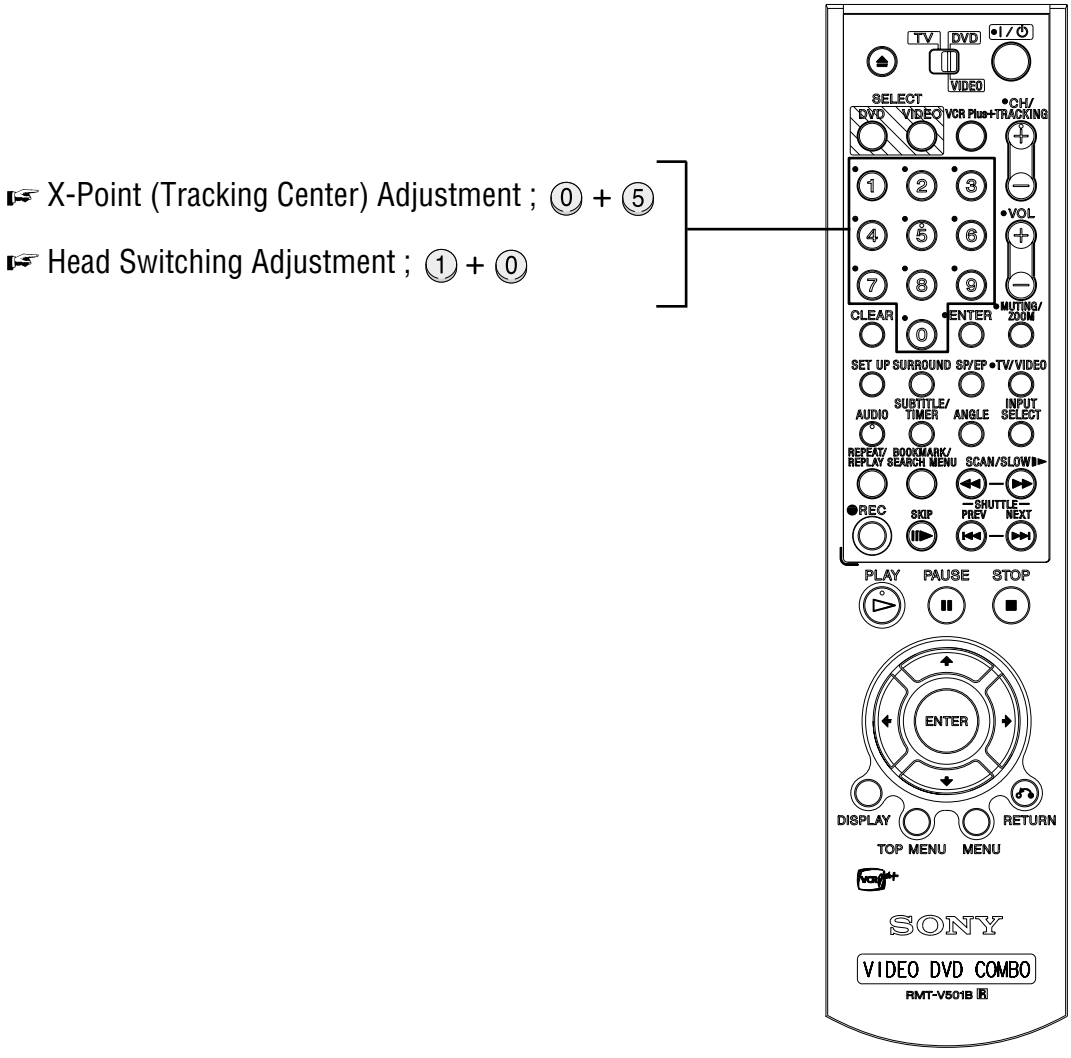


Fig. 6-1

6-1-1(b) TEST location for adjustment mode setting

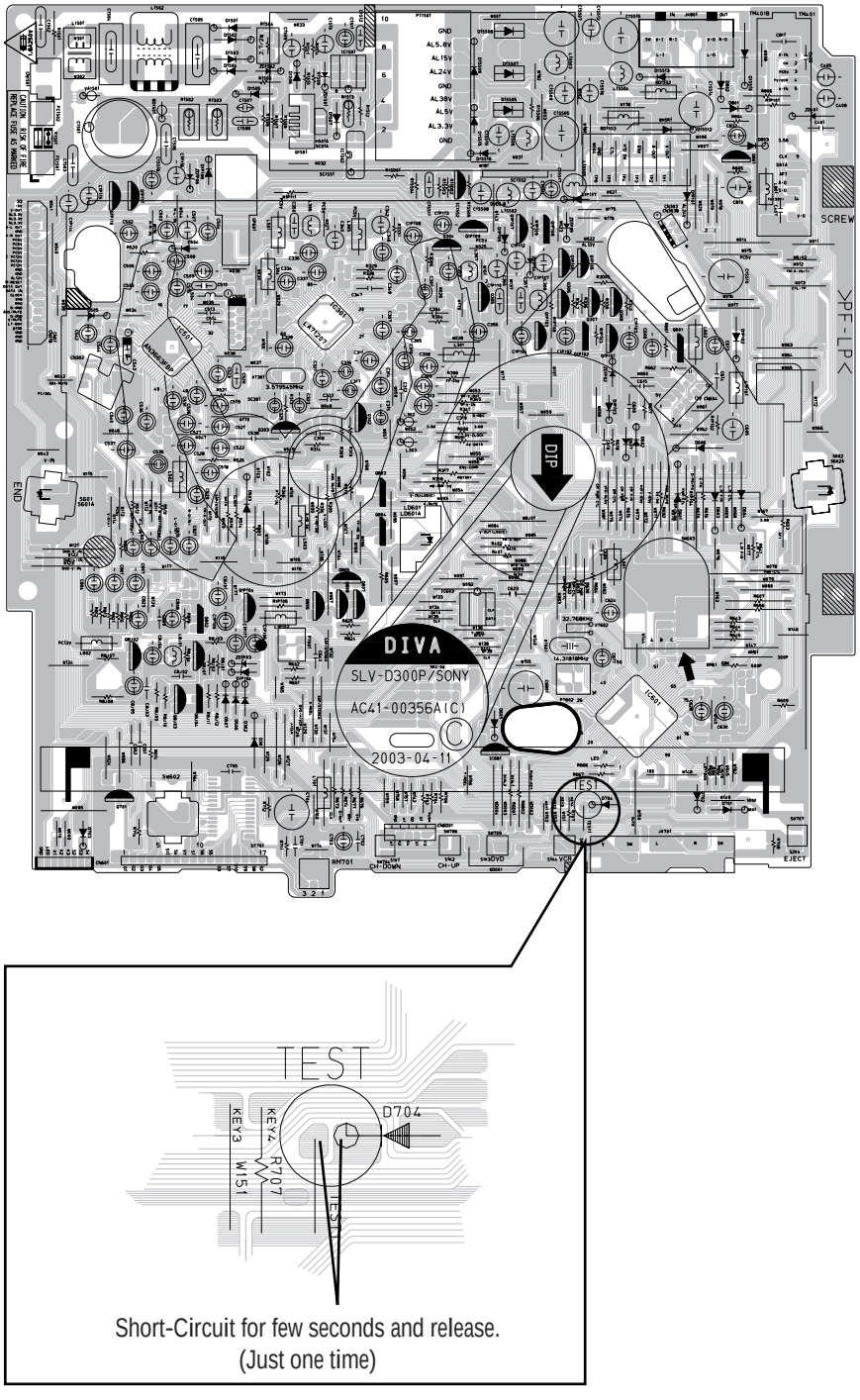


Fig. 6-2 Main PCB (Top View)

6-1-2 Head Switching Point Adjustment

1) Playback the alignment tape.
2) Intermittently short-circuit the two Test Points on Main PCB while setting the adjustment mode. (See Fig. 6-2)
3) Press the “1, 0” buttons ; remote control adjustment operates automatically. (See Fig. 6-1)

6-2 DVD ADJUSTMENT

6-2-1 Location of Test Point

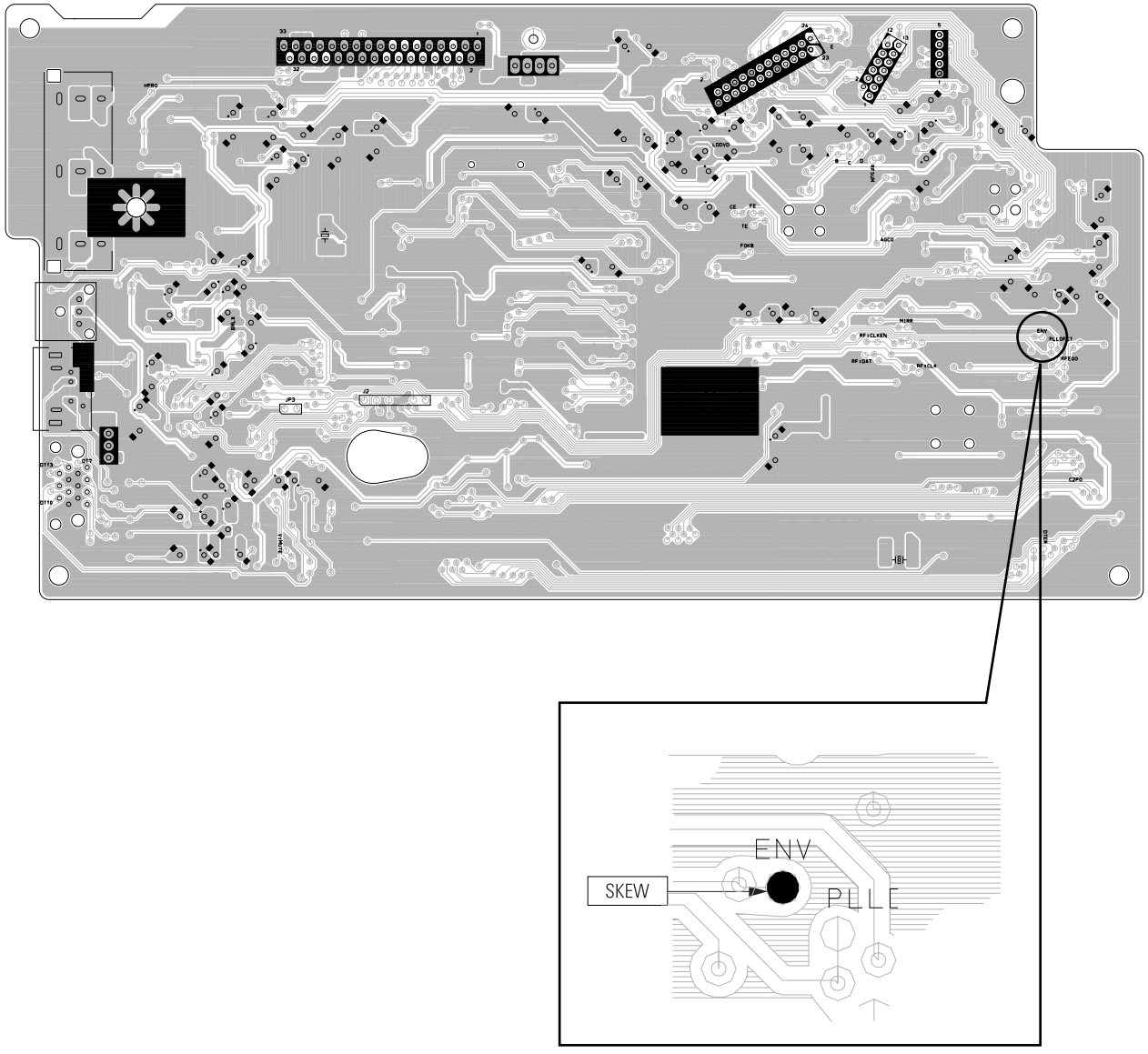


Fig. 6-3 Location of test Point (Main PCB - Top Side)

6-2-2 Skew Adjustment

6-2-2(a) Adjustment Spec. and Test Point

< Table 6-2 >

Test Disc	Adjustment Spec.	Test Point	Adjustment Location
TDV-533 Chapter 14 (P/N: J-6090-135-A)	Flat Waveform	“ENV” (DVD Main PCB - Top Side) (See Fig. 6-3)	Ass’y Deck - Top Side (See Fig. 6-4)

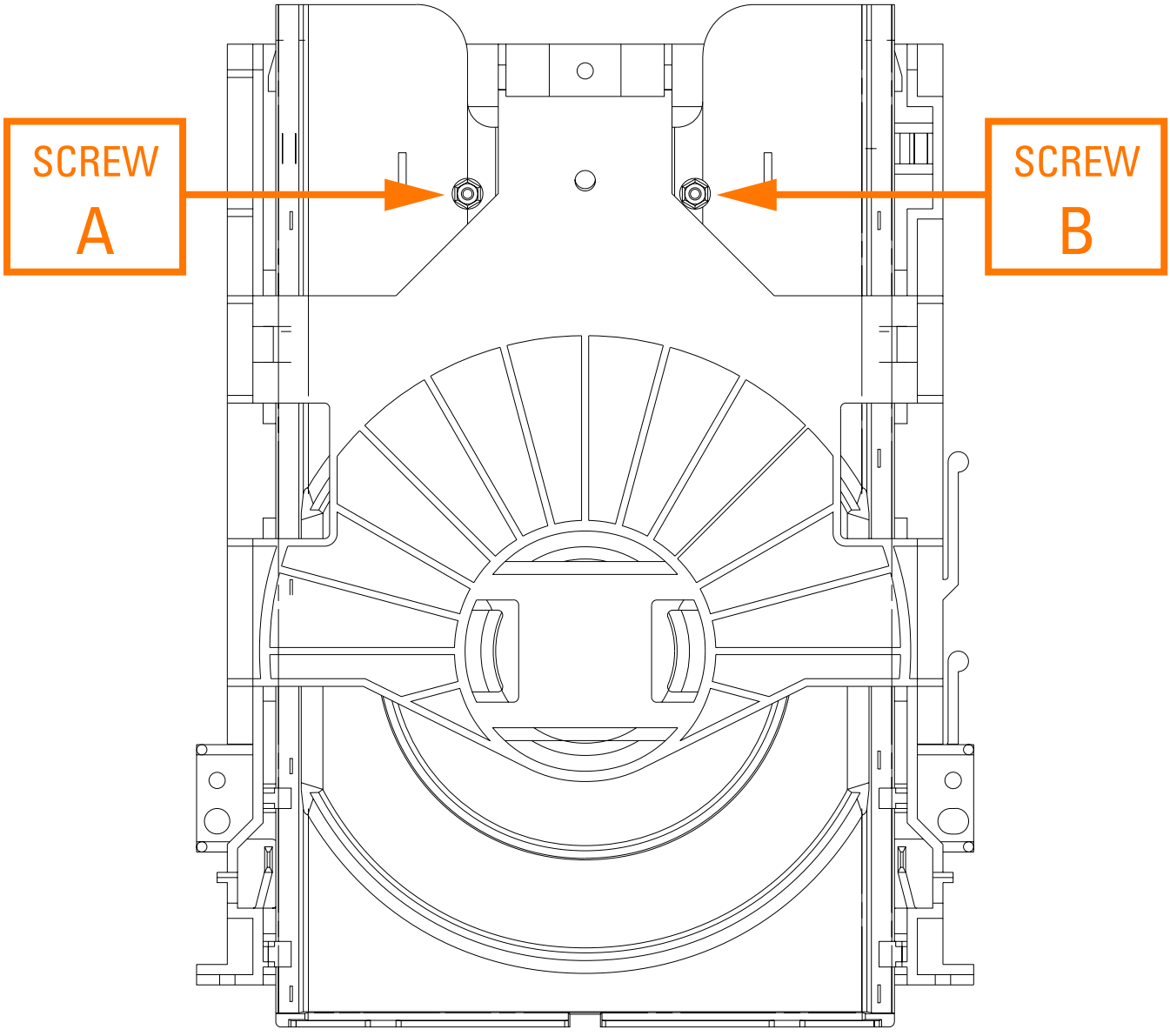


Fig. 6-4 Ass’y Deck (Top Side)

6-2-2(b) SKEW Adjustment Method

Needed to minimize the variations in Skew of the Pickup unit and to provide optimum match with the recorded signal on the Disc.

1) Connect an Oscilloscope to the “ENV” Test Point (See Fig. 6-3).
2) Connect Power, Open the Tray and Play CH. 14 which is in the TDV-533 Disc.
   - ◆ Set the Oscilloscope Range as follows :
     (Voltage ; 50mV/Div., Frequency ; 10m Sec.)
3) Adjust the Screws “A” and “B” (See Fig. 6-4) using a Hex screwdriver until you obtain a Flat Waveform and the picture is stable.
   Then, go to Chapter 1 and make sure the Waveform is Flat here as well.
   If not, you have to go back to Chapter 14 and adjust again.
   If you cannot obtain a Flat waveform, then the unit is defective.

Note: The Deck must be in a horizontal position. Use both “A” and “B” screws to adjust.

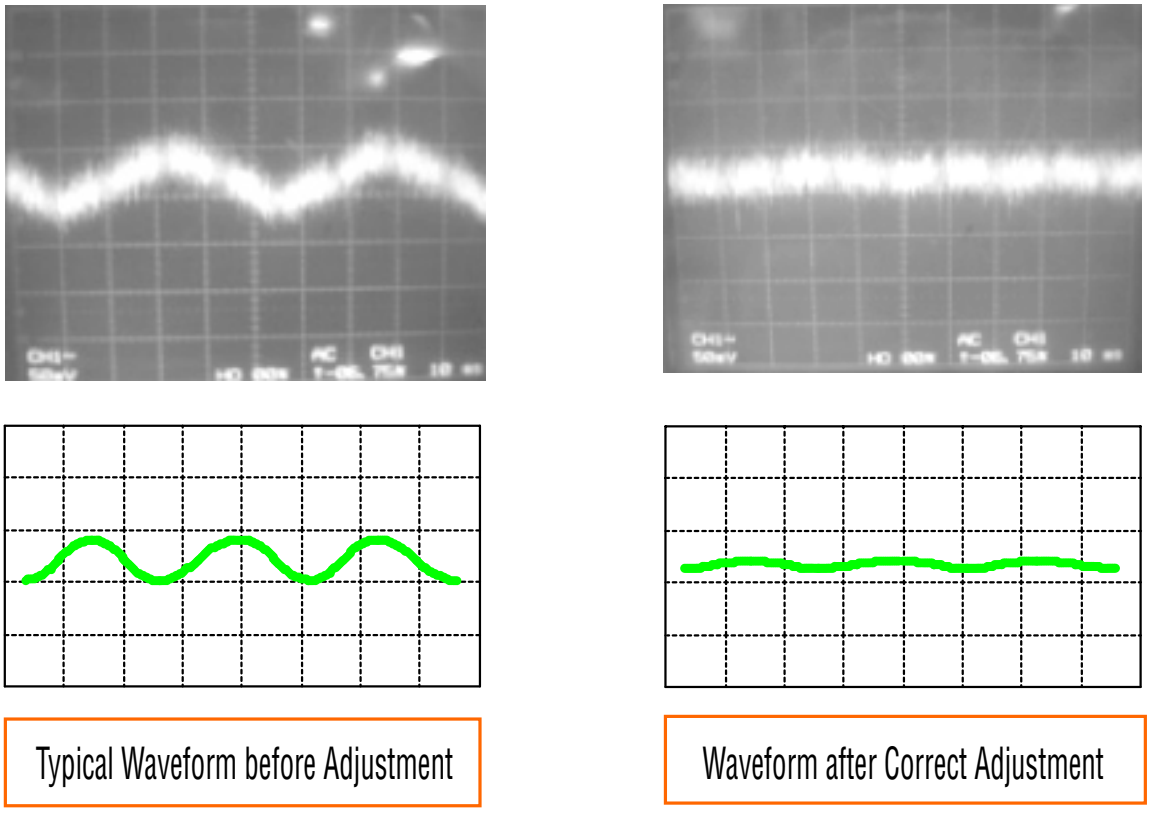


Fig. 6-5 Envelope Waveform

6-3 VCR MECHANICAL ADJUSTMENT

6-3-1 Tape Transport System and Adjustment Locations

The tape transport system has been adjusted precisely in the factory. Alignment is not necessary except for the following :

1) Noise observed on the screen.
2) Tape damage.
3) Parts replacement in the tape transport system.

Lower flange height of tape guide is used as the reference for the transport adjustment.
To maintain the height of the tape guide and prevent damage, do not apply excessive force onto the main base.

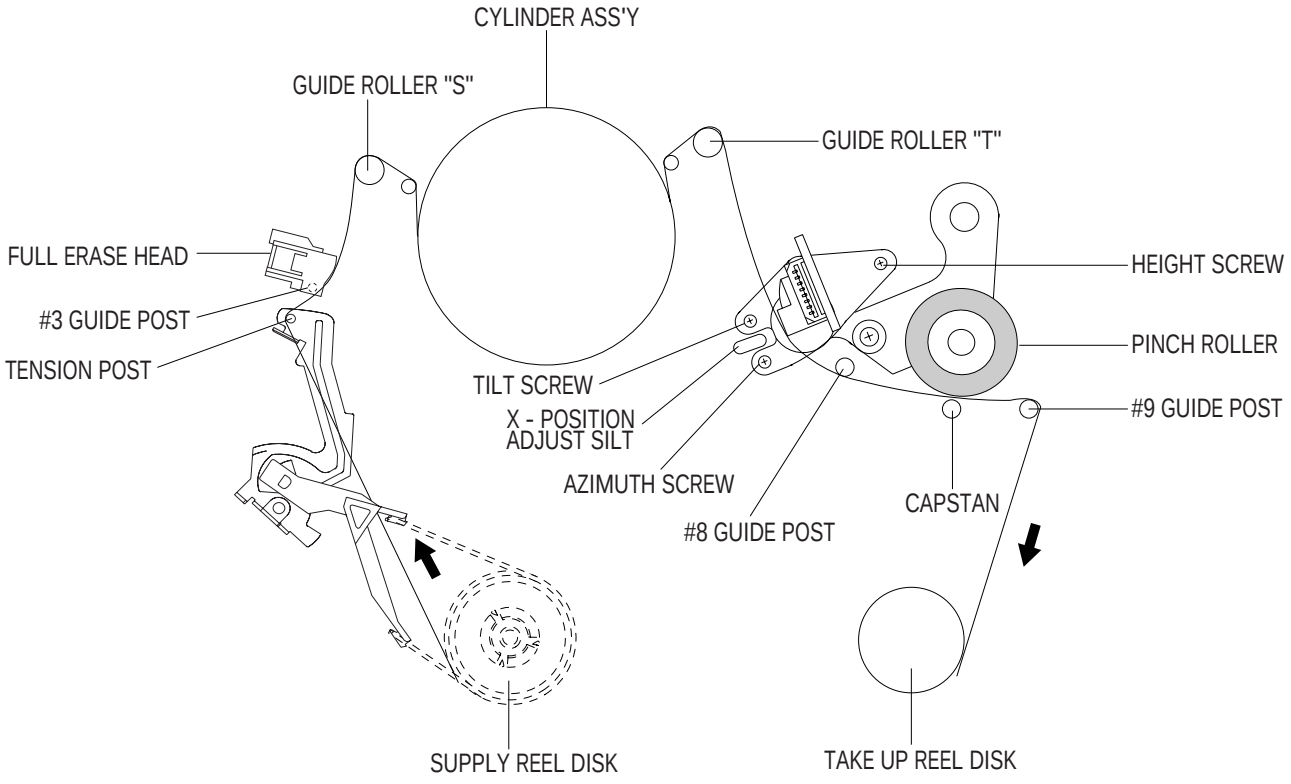


Fig. 6-6 Location of Tape Transport Adjustment

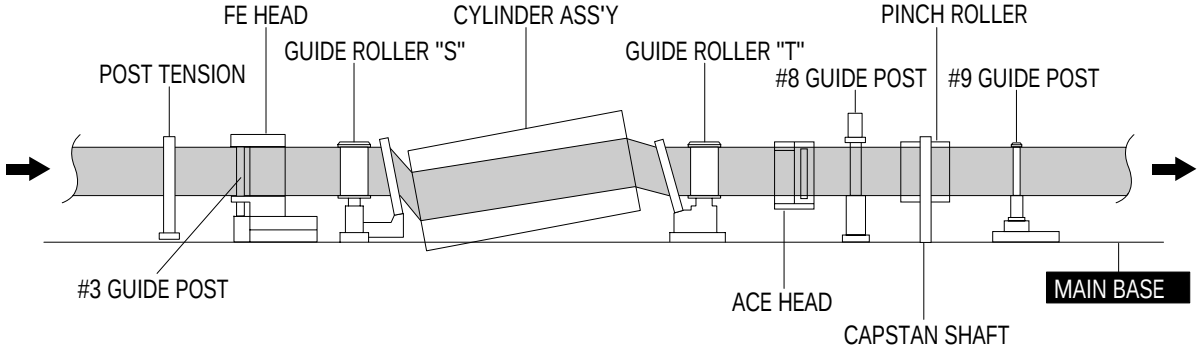


Fig. 6-7 Tape Travel Diagram

6-3-2 Tape Transport System Adjustment

When parts are replaced, perform the required adjustments by referring to procedures for the tape transport system. If there are any changes to the tape path, first run a T-120 tape and make sure excessive tape wrinkle does not occur at the tape guides.

◆ If tape wrinkle is observed at the guide roller S, T, turn the guide roller S, T until wrinkle disappears.
◆ If the tape wrinkle is still observed at the tape guide, perform the tilt adjustment of the ACE head.

(1) ACE Head Assembly Adjustment

a. ACE HEAD HEIGHT ADJUSTMENT

1) Run the alignment tape (Color bar) in the playback mode.
2) Observe surface of the audio head using a dental mirror.
3) Turn screw (C) clockwise or counterclockwise until the gap of lower tape edge and the lower edge of the control head is about 0.25mm. (Refer to Fig. 6-8 and 6-9)

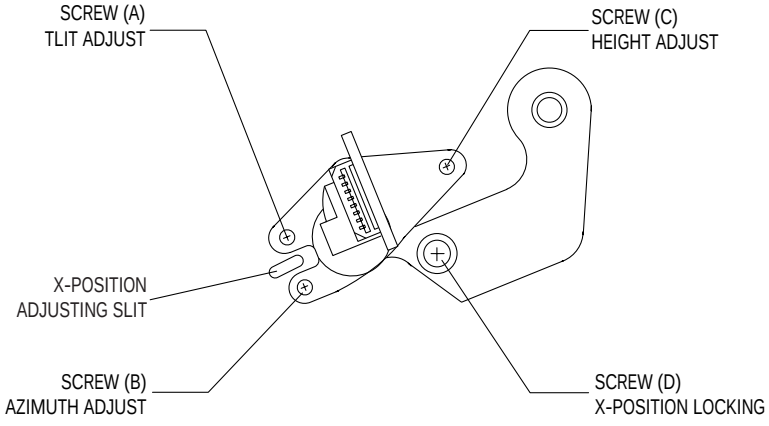


Fig. 6-8 Location of ACE Head Adjustment Screw

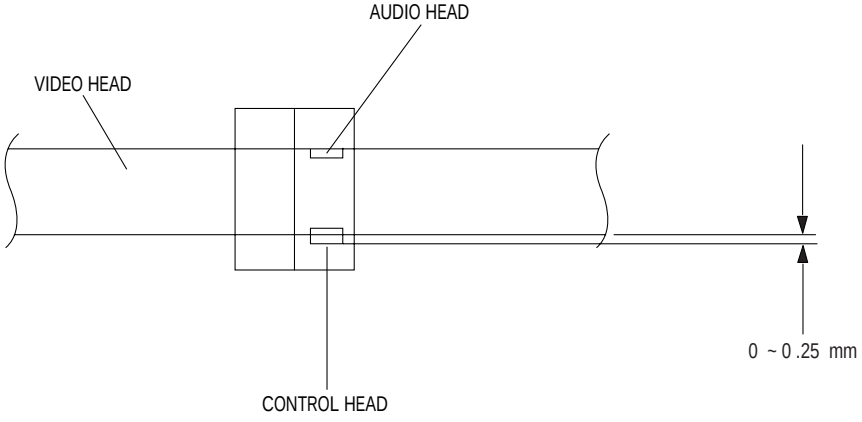


Fig. 6-9 ACE Head Height Adjustment

b. ACE HEAD TILT ADJUSTMENT

1) Playback a blank tape and observe the position of the tape at the lower flange of tape guide.
2) Confirm that there is no curl or wrinkle at the lower flange of tape guide as shown in Fig. 6-10 (B).
3) If a curl or wrinkle of the tape occurs, slightly turn the screw (A) tilt adjust on the ACE head ass'y.
4) Reconfirm the ACE head height.

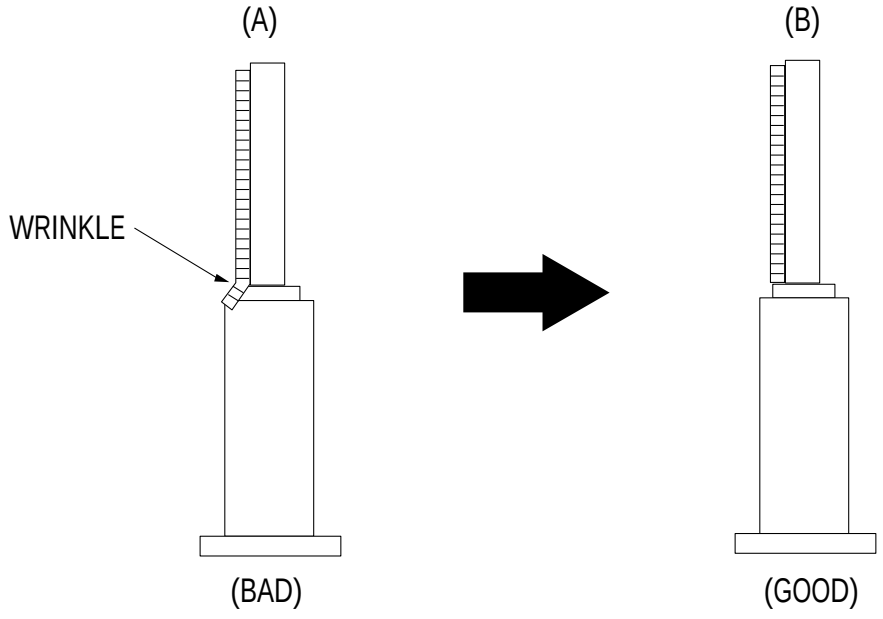


Fig. 6-10 Tape Guide Check

c. AUDIO AZIMUTH ADJUSTMENT

1) Load alignment tape (Mono scope) and playback the 7KHz signal.
2) Connect channel-1 scope probe to audio output.
3) Adjust screw (B) to achieve maximum audio level. (See Fig. 6-8)

d. ACE HEAD POSITION (X-POINT) ADJUSTMENT

1) Playback the alignment tape (Color bar)
2) Intermittently short-circuit the two Test Points on Main PCB . (See Fig. 6-2)
3) Press the “0, 5” remote control buttons, then adjustment is operates automatically. (See Fig. 6-1)
4) Connect the CH-1 probe to “Envelope” the CH-2 probe to “H’D switching pulse” and then trigger to CH-1.
5) Insert the (-) driver into the X-Point adjustment hole and adjust it so that envelope waveform is maximum.

Test point: TP2 (Audio Output)
TP3 (Envelope)
TP4 (H’D S/W -Trigger)
TP5 (Control Pulse)

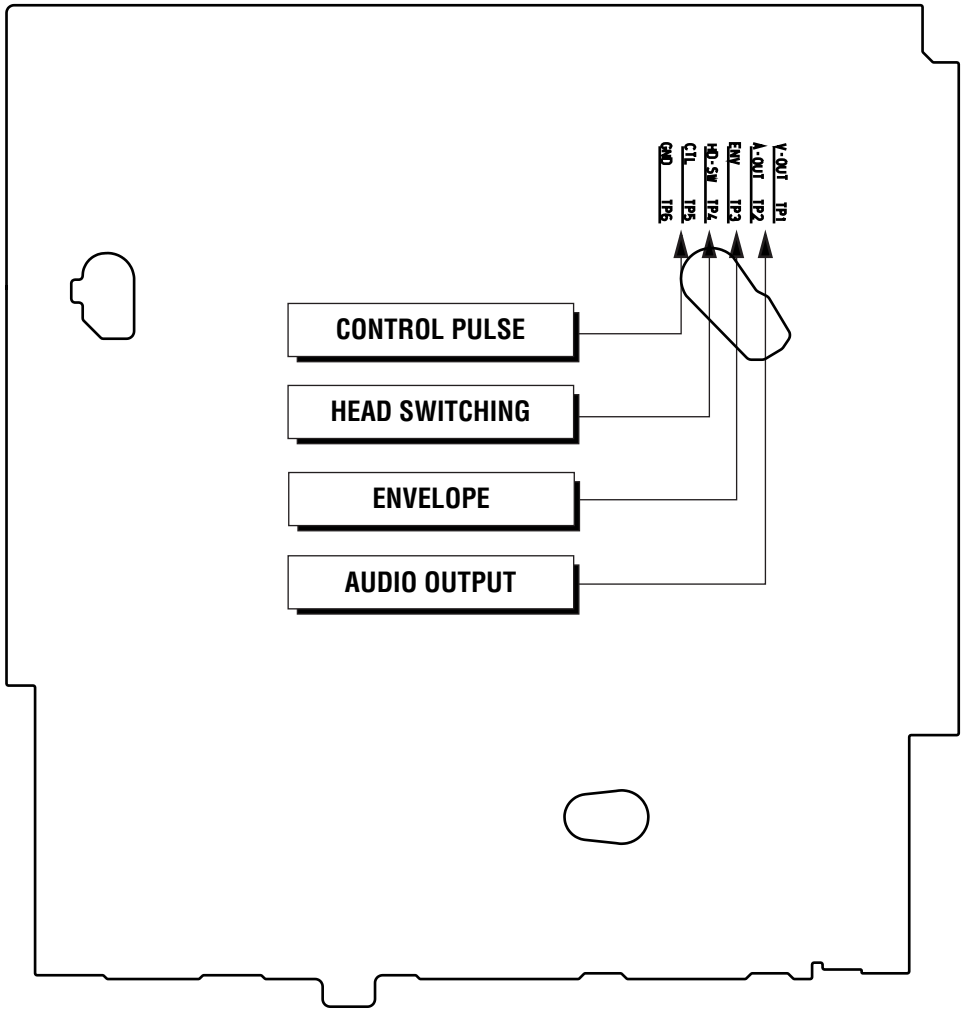


Fig. 6-11 Location of Test point (VCR Main PCB-Top View)

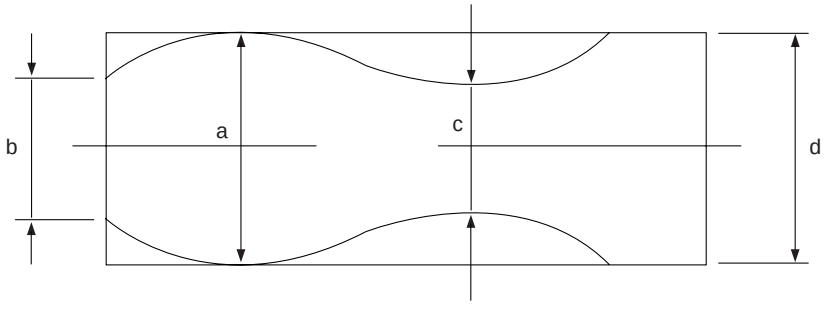
(2) Linearity adjustment (Guide roller S, T adjustment)

1) Playback the Mono Scope alignment tape (SP mode).
2) Observe the video envelope signal on an oscilloscope (triggered by the video switching pulse).
3) Make sure the video envelope waveform (at its minimum) meets the specification shown in Fig. 6-12.
   If it does not, adjust as follows :

Note:

a=Maximum output of the video RF envelope.
b=Minimum output of the video RF envelope at the entrance side.
c=Minimum output of the video RF envelope at the center point.
d=Maximum output of the video RF envelope at the exit side.

4) If the section A in Fig. 6-13 does not meet the specification, adjust the guide roller S up or down.
5) If the section B in Fig. 6-13 does not meet the specification, adjust the guide roller T up or down.



a b c d

c,b,d/a ≧ 63%

Fig. 6-12 Envelope Waveform Adjustment

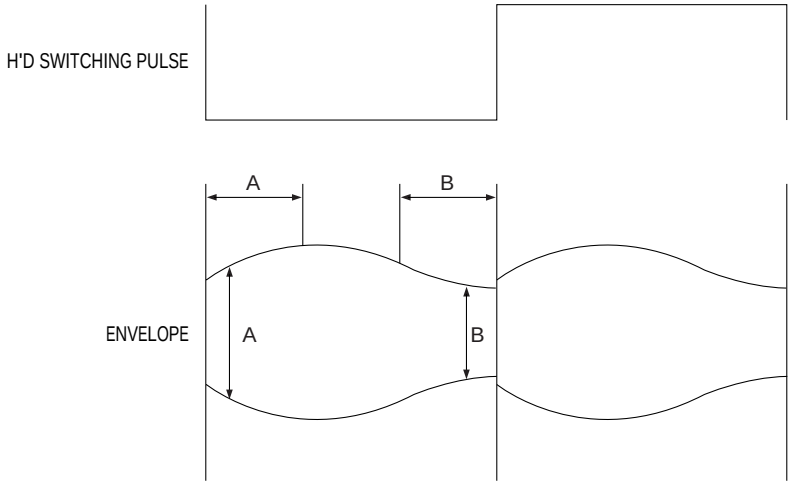


Fig. 6-13 Adjustment Points

6) Play back the Mono Scope alignment tape (SP mode).
7) Connect an oscilloscope CH-1 to the “Envelope” and CH-2 to the “H’D SW Pulse” for triggering.
8) Turn the guide roller heads with a flat head ( ) driver to obtain a flat video RF envelope as shown in Fig. 6-14.

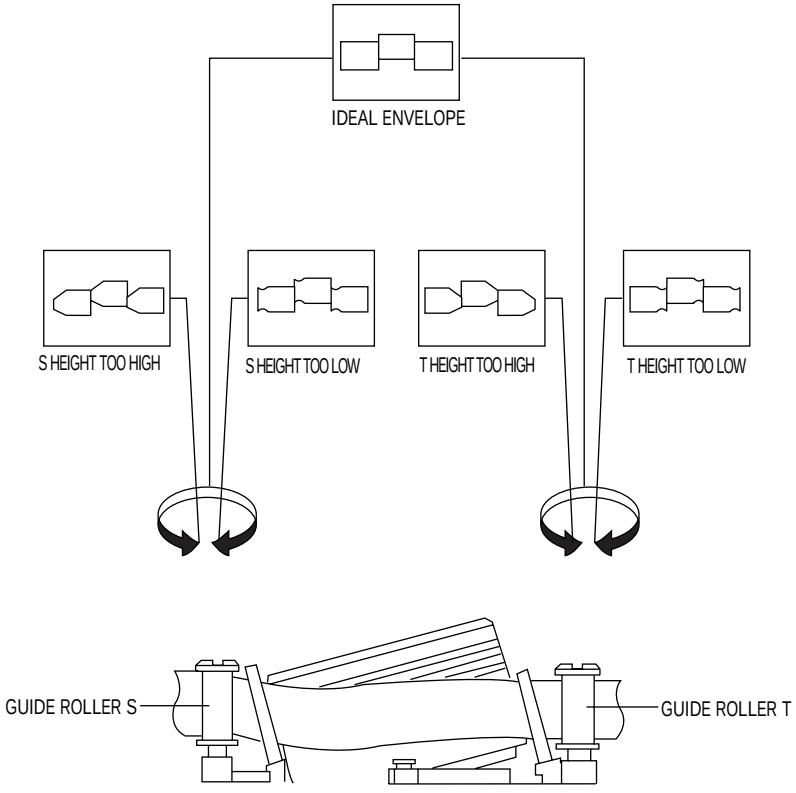


Fig. 6-14 Guide Roller S, T Height Adjustment

(3) Check Transitional Operation from RPS to Play

Check transition from RPS mode to play mode : Using a pre-recorded SP tape, make sure the entry side of envelope comes to an appropriate steady state within 3 seconds (as shown in Fig. 6-15).
If the envelope waveform does not reach specified peak-to peak amplitude within 3 seconds, adjust as follows :

1) Make sure there is no gap between the supply roller lower flange and the tape.
   If there is a gap, adjust the supply guide roller again.
2) Change operation mode from the RPS to the play mode (again) and make sure the entry side of envelope rises within 3 second.

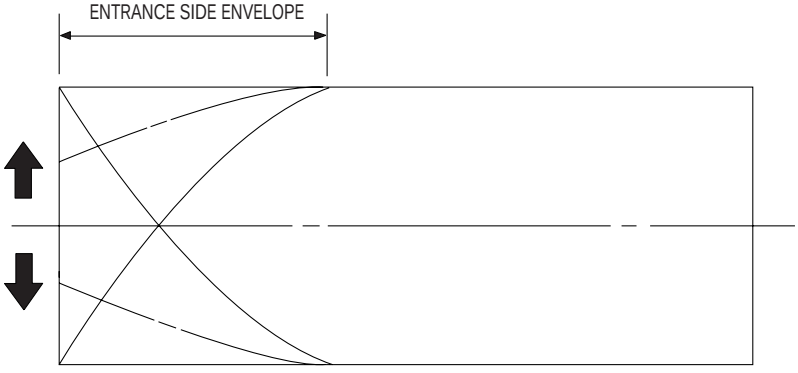


Fig. 6-15 Video Envelope Rising when Operation mode Changes from RPS to Play Mode

(4) Envelope Check

1) Make recordings on T-120 (E-120) and T-160 (E-180) tape.
   Make sure the playback output envelope meets the specification as shown in Fig. 6-16.
2) Play back a self recorded tape (recording made on the unit using with T-120 (E-120).
   The video envelope should meet the specification as shown in Fig. 6-16.
   In SP mode, (A) should equal (B).
   If the head gap is wide, upper cylinder should be checked.

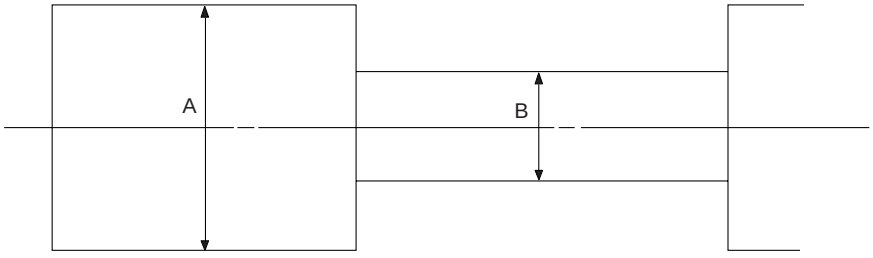


Fig. 6-16 Envelope Input and Output Level

(5) Tape Wrinkle Check

1) Run the T-160 (E-180) tape in the playback, FPS, RPS and Pause modes and observe tape wrinkle at each guide.
2) If excessive tape wrinkle is observed, perform the following adjustments in Playback mode :

- ◆ Tape wrinkle at the guide roller S, T section : Linearity adjustment.
- ◆ Tape wrinkle at tape guide flange : ACE head assembly coarse adjustment.

6-3-3 Reel Torque

1) The rotation of the capstan motor causes the holder clutch ass'y to rotate through the belt pulley.
2) The spring wrap PLAY/REV of holder clutch ass'y drives the disk reel S, T through gear idler by rotation of gear center ass'y.
3) Brake is operated by slider cam at FF/REW mode.
4) Transportation of accurate driving force is done by gears. (Gear Center Ass'y)

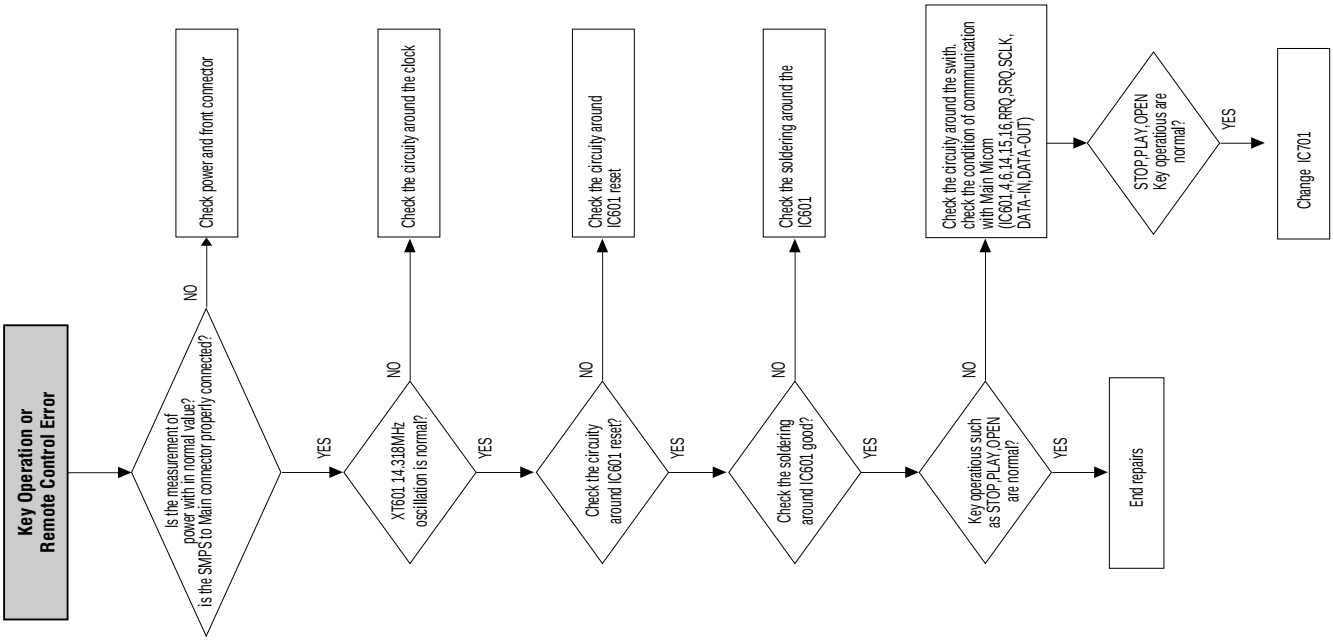
Note: If the spec. does not meet the followings specifications, replace the holder clutch ass'y and then recheck.

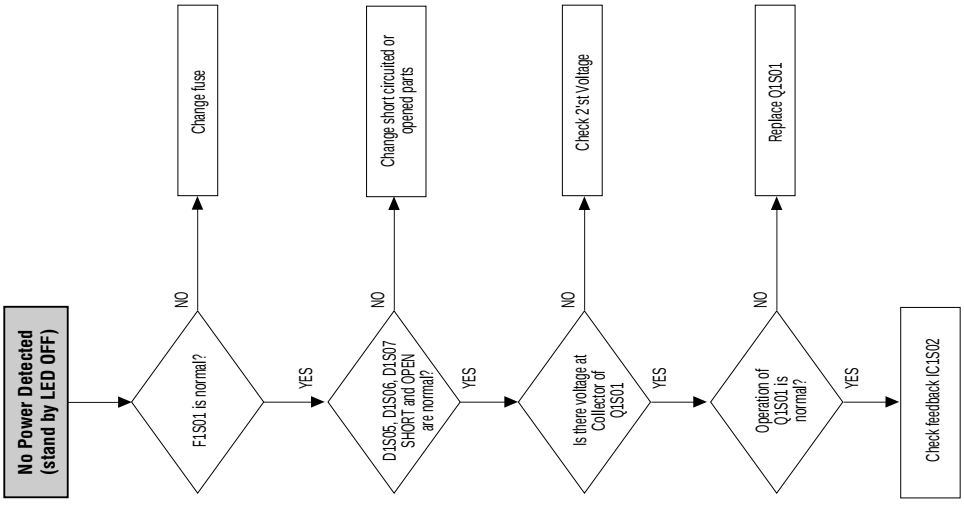
< Table 6-2 >

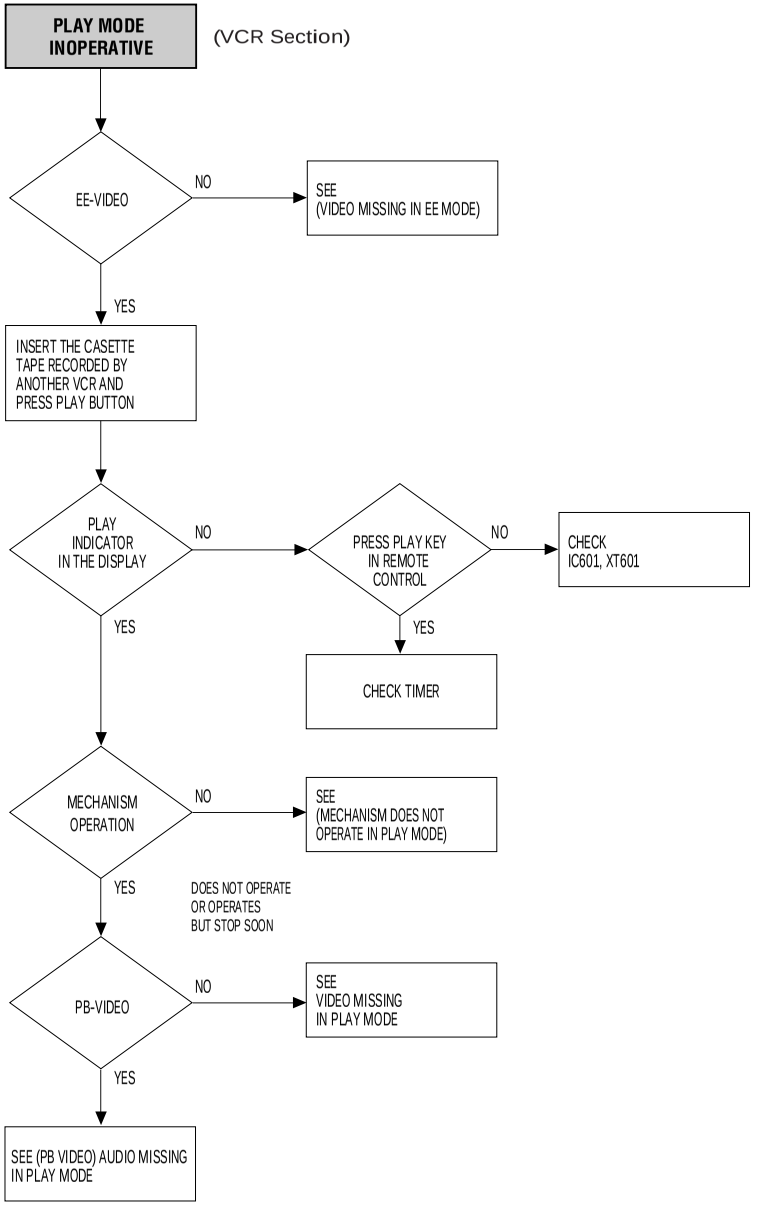
MODE	TORQUE g/cm	GAUGE
PB	42 ± 11	Cassette Torquemeter
RPS	145 ± 30	Cassette Torquemeter

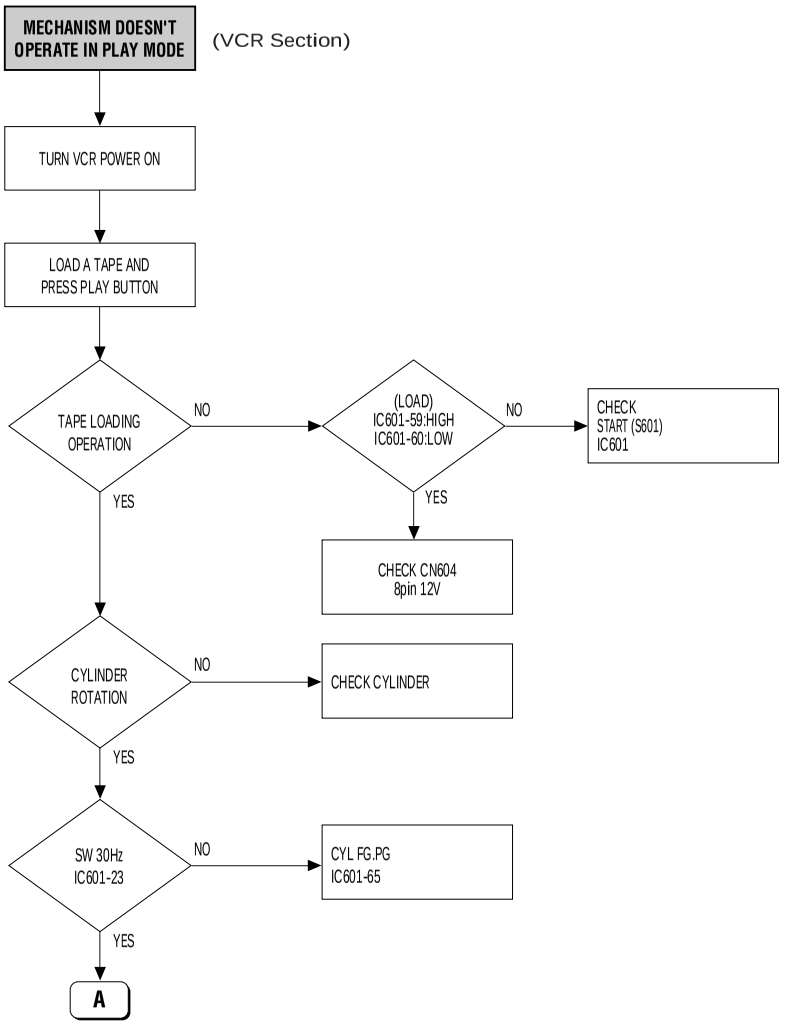
MEMO

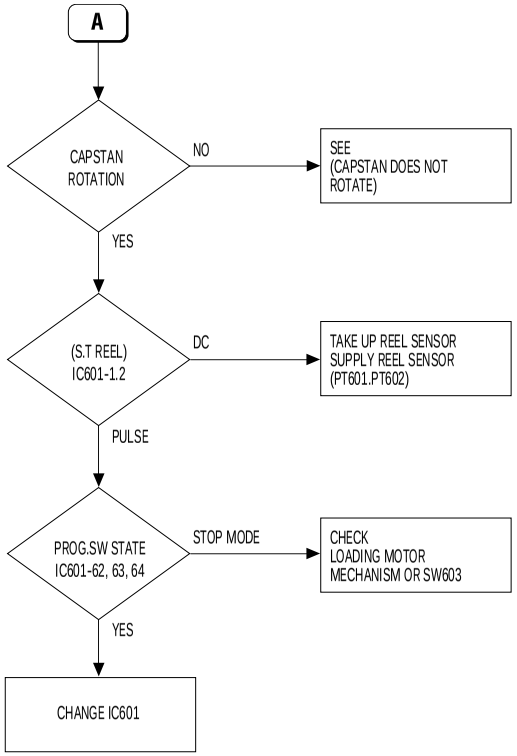
7. TROUBLESHOOTING

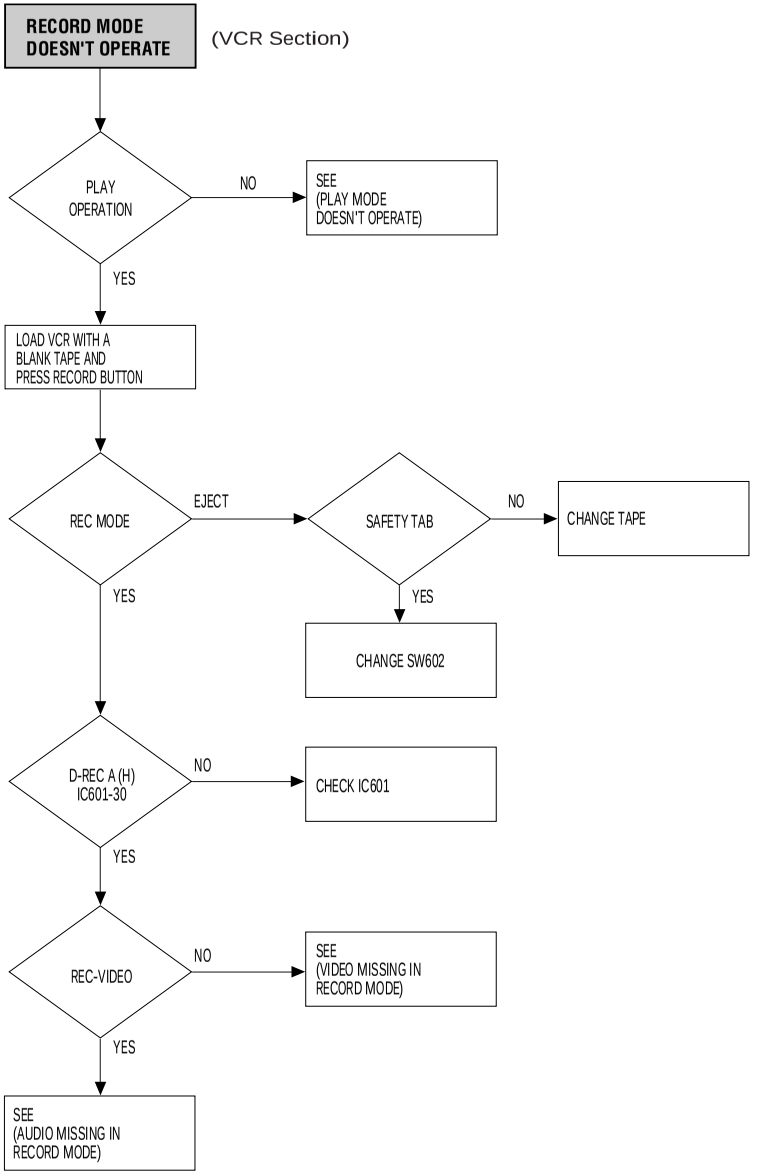

Key Operation or Remote Control Error
Is the measurement of power with in normal value? is the SMPS to Main connector properly connected?
NO
Check power and front connector
YES
XT601 14.318MHz oscillation is normal?
NO
Check the circuity around the clock
YES
Check the circuity around IC601 reset?
NO
Check the circuity around IC601 reset
YES
Check the soldering around IC601 good?
NO
Check the soldering around the IC601
YES
Key operatious such as STOP,PLAY,OPEN are normal?
NO
Check the circuity around the swith, check the condition of commmunication with Main Micom (IC601,4,6,14,15,16,RRQ,SRQ,SCLK, DATA-IN,DATA-OUT)
YES
End repairs
STOP,PLAY,OPEN Key operatious are normal?
YES
Change IC701

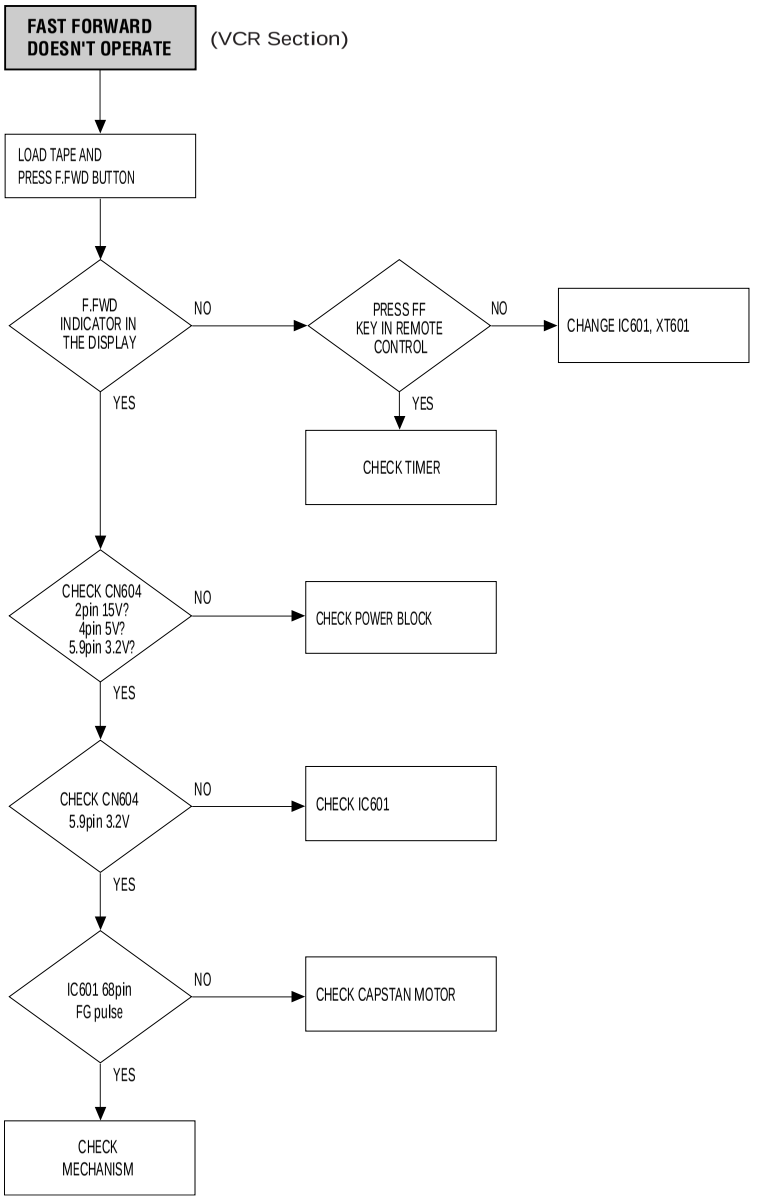


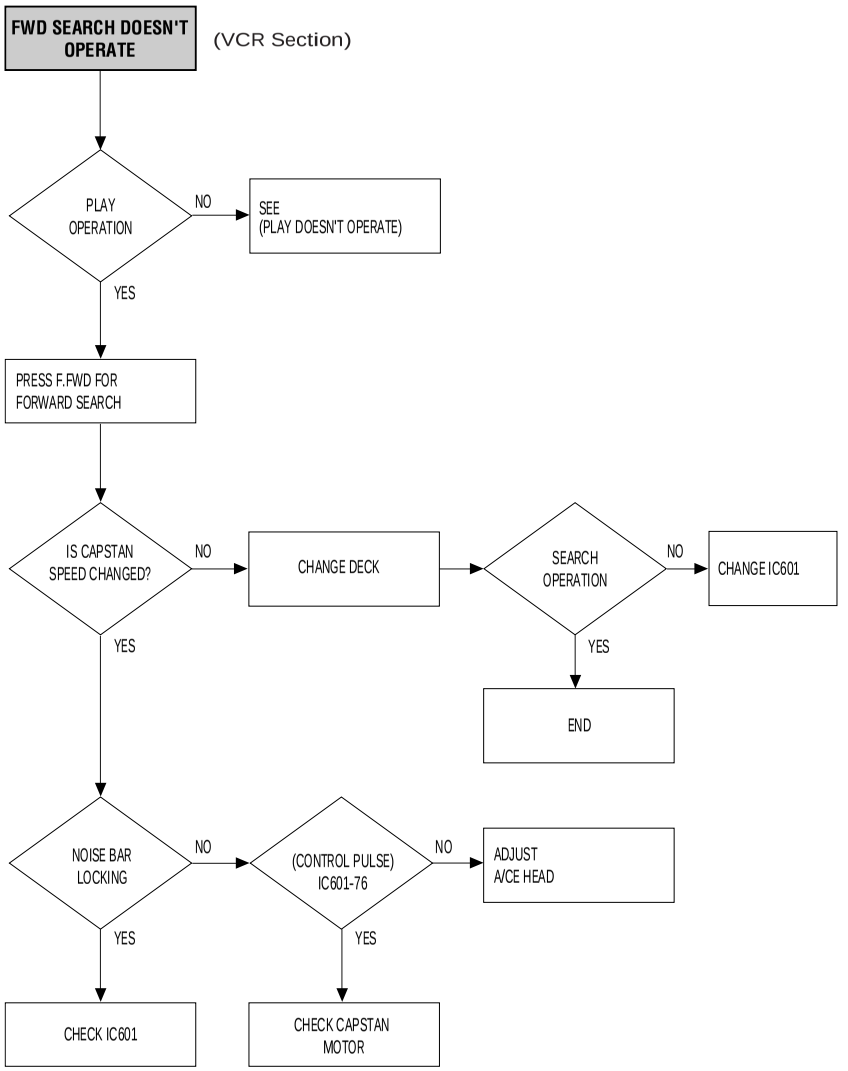

PLAY MODE INOPERATIVE
(VCR Section)
EE-VIDEO
NO
SEE (VIDEO MISSING IN EE MODE)
YES
INSERT THE CASETTE TAPE RECORDED BY ANOTHER VCR AND PRESS PLAY BUTTON
PLAY INDICATOR IN THE DISPLAY
NO
PRESS PLAY KEY IN REMOTE CONTROL
NO
CHECK IC601, XT601
YES
YES
CHECK TIMER
MECHANISM OPERATION
NO
SEE (MECHANISM DOES NOT OPERATE IN PLAY MODE)
YES
DOES NOT OPERATE OR OPERATES BUT STOP SOON
PB-VIDEO
NO
SEE VIDEO MISSING IN PLAY MODE
YES
SEE (PB VIDEO) AUDIO MISSING IN PLAY MODE

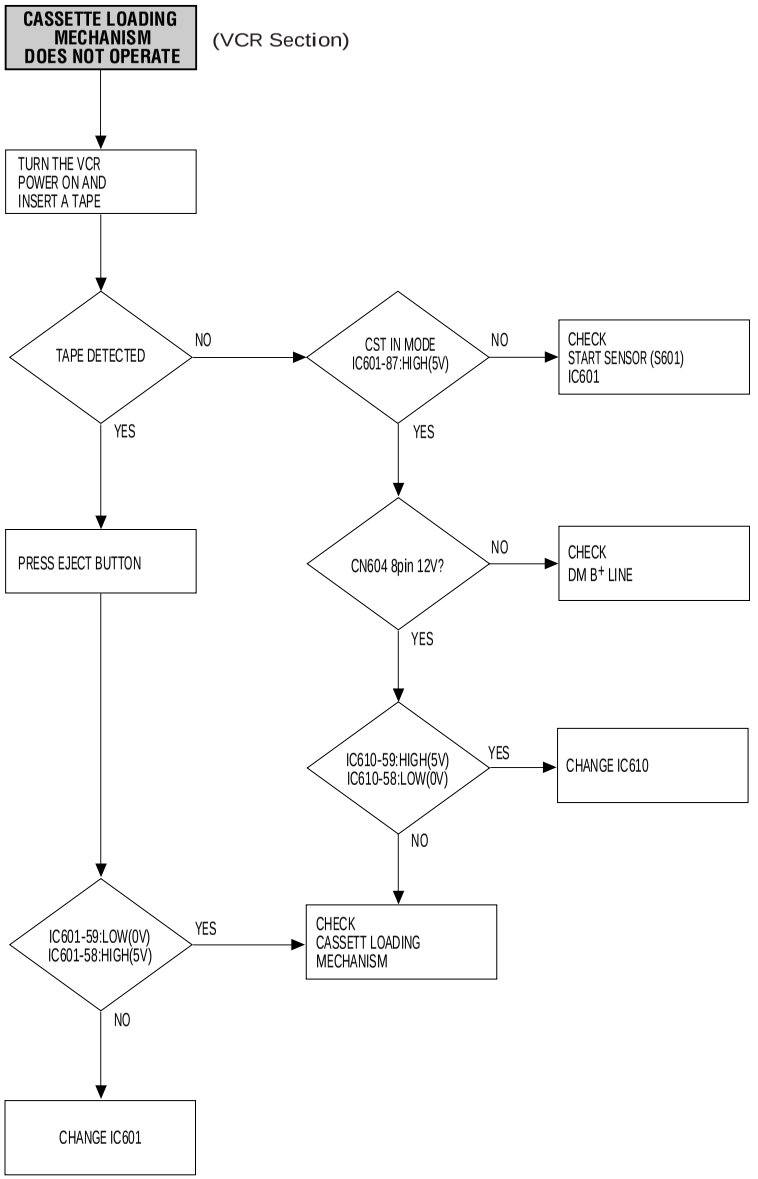

MECHANISM DOESN'T OPERATE IN PLAY MODE
(VCR Section)
TURN VCR POWER ON
LOAD A TAPE AND PRESS PLAY BUTTON
TAPE LOADING OPERATION
NO
(LOAD) IC601-59:HIGH IC601-60:LOW
NO
CHECK START (S601) IC601
YES
YES
CHECK CN604 8pin 12V
CYLINDER ROTATION
NO
CHECK CYLINDER
YES
SW 30Hz IC601-23
NO
CYL FG.PG IC601-65
YES
A

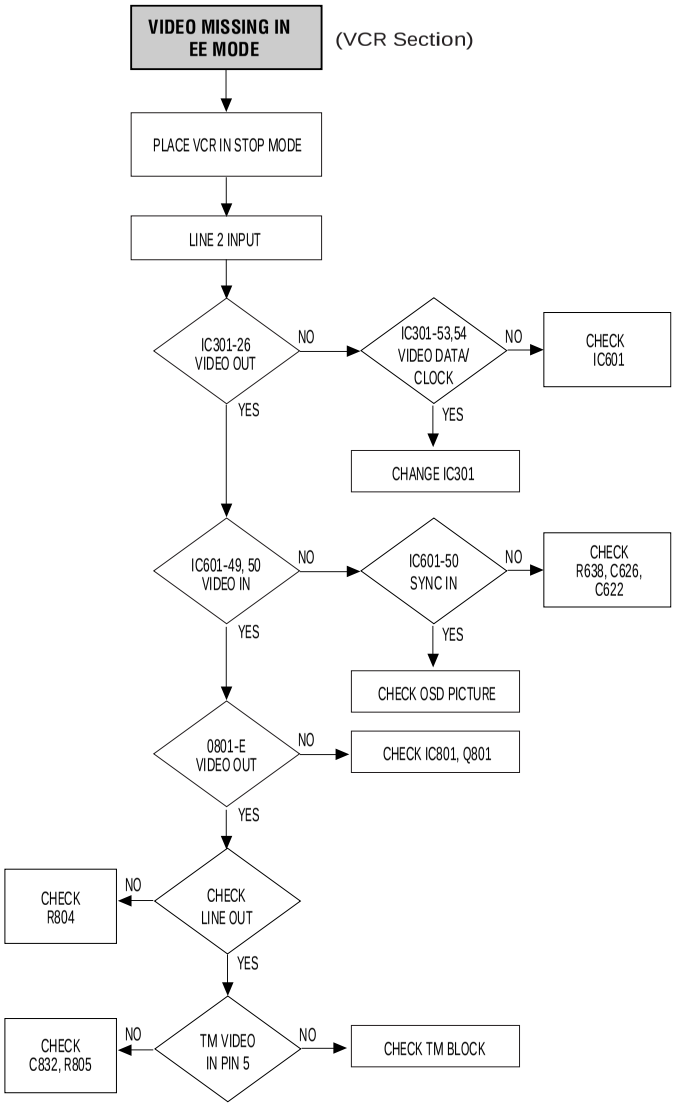

A
CAPSTAN ROTATION
NO
SEE (CAPSTAN DOES NOT ROTATE)
YES
(S.T REEL) IC601-1.2
DC
TAKE UP REEL SENSOR SUPPLY REEL SENSOR (PT601.PT602)
PULSE
PROG.SW STATE IC601-62, 63, 64
STOP MODE
CHECK LOADING MOTOR MECHANISM OR SW603
YES
CHANGE IC601

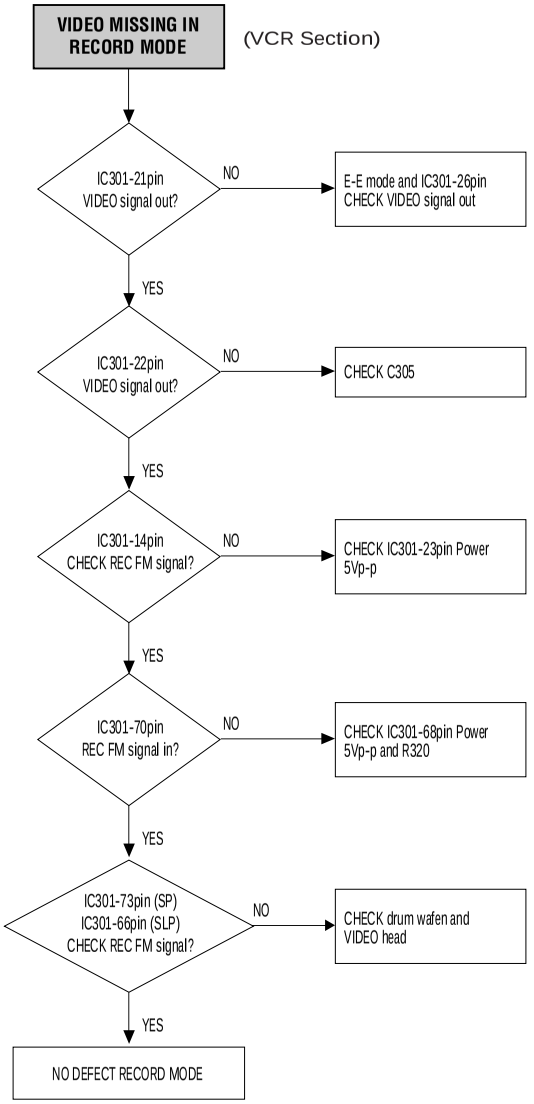

RECORD MODE DOESN'T OPERATE
(VCR Section)
PLAY OPERATION
NO
SEE (PLAY MODE DOESN'T OPERATE)
YES
LOAD VCR WITH A BLANK TAPE AND PRESS RECORD BUTTON
REC MODE
EJECT
SAFETY TAB
NO
CHANGE TAPE
YES
YES
CHANGE SW602
D-REC A (H) IC601-30
NO
CHECK IC601
YES
REC-VIDEO
NO
SEE (VIDEO MISSING IN RECORD MODE)
YES
SEE (AUDIO MISSING IN RECORD MODE)

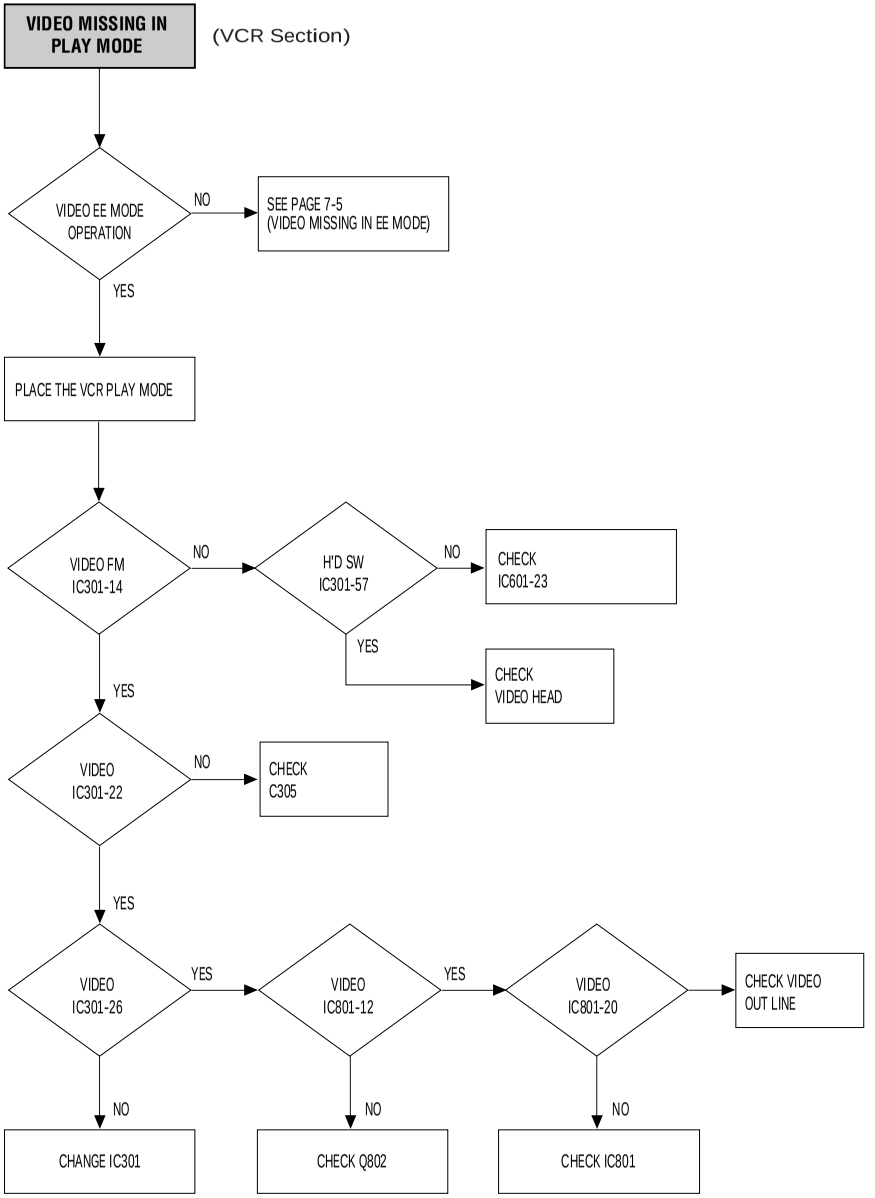

FAST FORWARD DOESN'T OPERATE
(VCR Section)
LOAD TAPE AND PRESS F.FWD BUTTON
F.FWD INDICATOR IN THE DISPLAY
NO
PRESS FF KEY IN REMOTE CONTROL
NO
CHANGE IC601, XT601
YES
YES
CHECK TIMER
CHECK CN604 2pin 15V? 4pin 5V? 5.9pin 3.2V?
NO
CHECK POWER BLOCK
YES
CHECK CN604 5.9pin 3.2V
NO
CHECK IC601
YES
IC601 68pin FG pulse
NO
CHECK CAPSTAN MOTOR
YES
CHECK MECHANISM

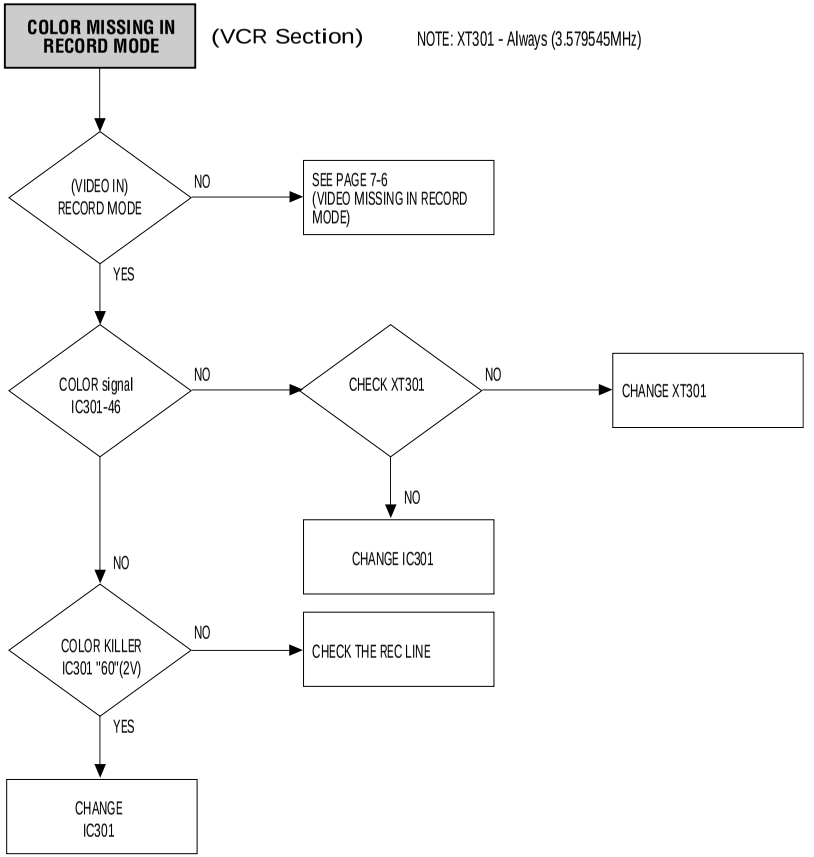

FWD SEARCH DOESN'T OPERATE
(VCR Section)
PLAY OPERATION
NO
SEE (PLAY DOESN'T OPERATE)
YES
PRESS F.FWD FOR FORWARD SEARCH
IS CAPSTAN SPEED CHANGED?
NO
CHANGE DECK
SEARCH OPERATION
NO
CHANGE IC601
YES
YES
END
NOISE BAR LOCKING
NO
(CONTROL PULSE) IC601-76
NO
ADJUST A/CE HEAD
YES
YES
CHECK IC601
CHECK CAPSTAN MOTOR

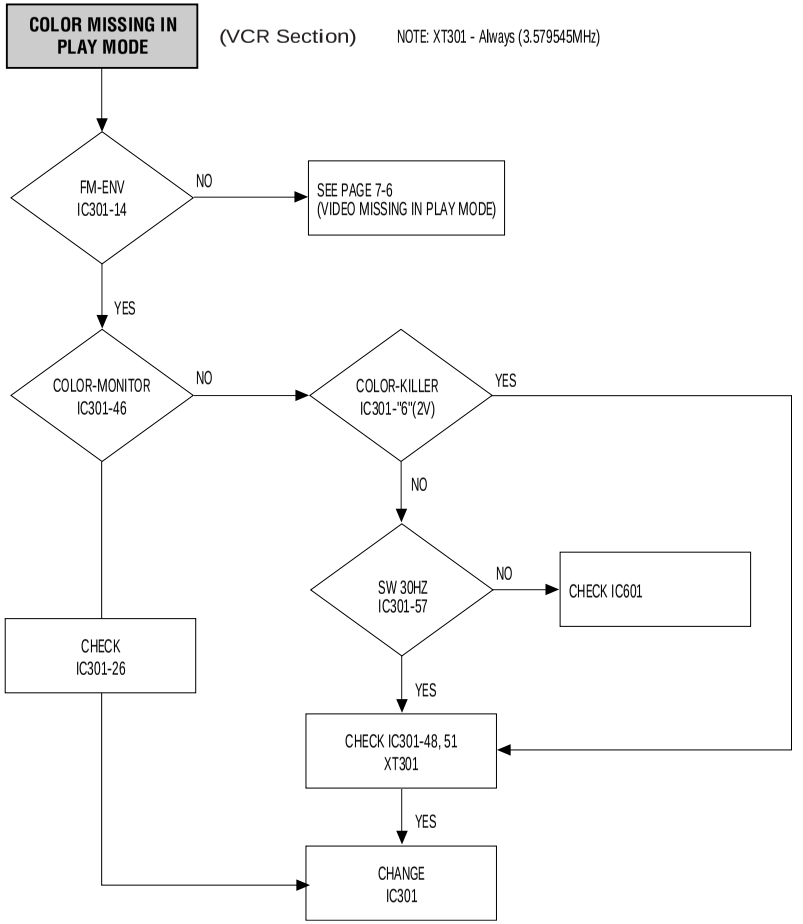

CASSETTE LOADING MECHANISM DOES NOT OPERATE
(VCR Section)
TURN THE VCR POWER ON AND INSERT A TAPE
TAPE DETECTED
NO
YES
CST IN MODE IC601-87:HIGH(5V)
NO
CHECK START SENSOR (S601) IC601
YES
PRESS EJECT BUTTON
CN604 8pin 12V?
NO
CHECK DM B+ LINE
YES
IC610-59:HIGH(5V) IC610-58:LOW(0V)
YES
CHANGE IC610
NO
IC601-59:LOW(0V) IC601-58:HIGH(5V)
YES
CHECK CASSETT LOADING MECHANISM
NO
CHANGE IC601


VIDEO MISSING IN EE MODE
(VCR Section)
PLACE VCR IN STOP MODE
LINE 2 INPUT
IC301-26 VIDEO OUT
NO
IC301-53,54 VIDEO DATA/ CLOCK
NO
CHECK IC601
YES
YES
CHANGE IC301
IC601-49, 50 VIDEO IN
NO
IC601-50 SYNC IN
NO
CHECK R638, C626, C622
YES
YES
CHECK OSD PICTURE
0801-E VIDEO OUT
NO
CHECK IC801, Q801
YES
CHECK LINE OUT
NO
CHECK R804
YES
TM VIDEO IN PIN 5
NO
CHECK TM BLOCK
NO
CHECK C832, R805

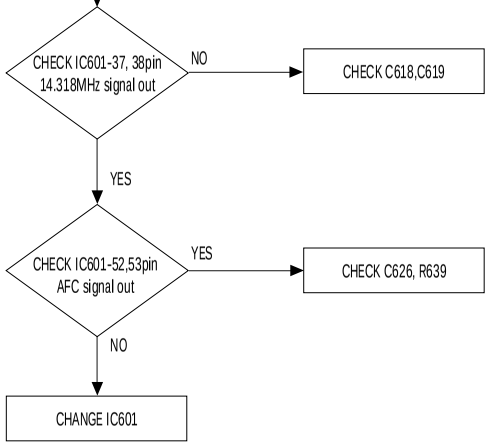

VIDEO MISSING IN RECORD MODE
(VCR Section)
IC301-21pin VIDEO signal out?
NO
E-E mode and IC301-26pin CHECK VIDEO signal out
YES
IC301-22pin VIDEO signal out?
NO
CHECK C305
YES
IC301-14pin CHECK REC FM signal?
NO
CHECK IC301-23pin Power 5Vp-p
YES
IC301-70pin REC FM signal in?
NO
CHECK IC301-68pin Power 5Vp-p and R320
YES
IC301-73pin (SP) IC301-66pin (SLP) CHECK REC FM signal?
NO
CHECK drum wafen and VIDEO head
YES
NO DEFECT RECORD MODE


VIDEO MISSING IN PLAY MODE
(VCR Section)
VIDEO EE MODE OPERATION
NO
SEE PAGE 7-5 (VIDEO MISSING IN EE MODE)
YES
PLACE THE VCR PLAY MODE
VIDEO FM IC301-14
NO
H'D SW IC301-57
NO
CHECK IC601-23
YES
CHECK VIDEO HEAD
YES
VIDEO IC301-22
NO
CHECK C305
YES
VIDEO IC301-26
YES
VIDEO IC801-12
YES
VIDEO IC801-20
CHECK VIDEO OUT LINE
NO
CHANGE IC301
NO
CHECK Q802
NO
CHECK IC801

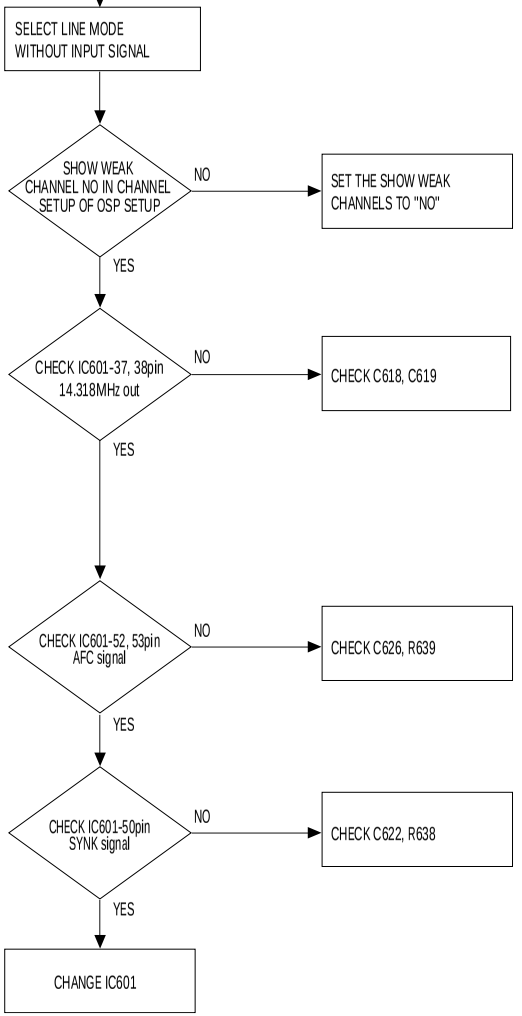

COLOR MISSING IN RECORD MODE
(VCR Section)
NOTE: XT301 - Always (3.579545MHz)
(VIDEO IN) RECORD MODE
NO
SEE PAGE 7-6 (VIDEO MISSING IN RECORD MODE)
YES
COLOR signal IC301-46
NO
CHECK XT301
NO
CHANGE XT301
NO
CHANGE IC301
NO
COLOR KILLER IC301 "60"(2V)
NO
CHECK THE REC LINE
YES
CHANGE IC301

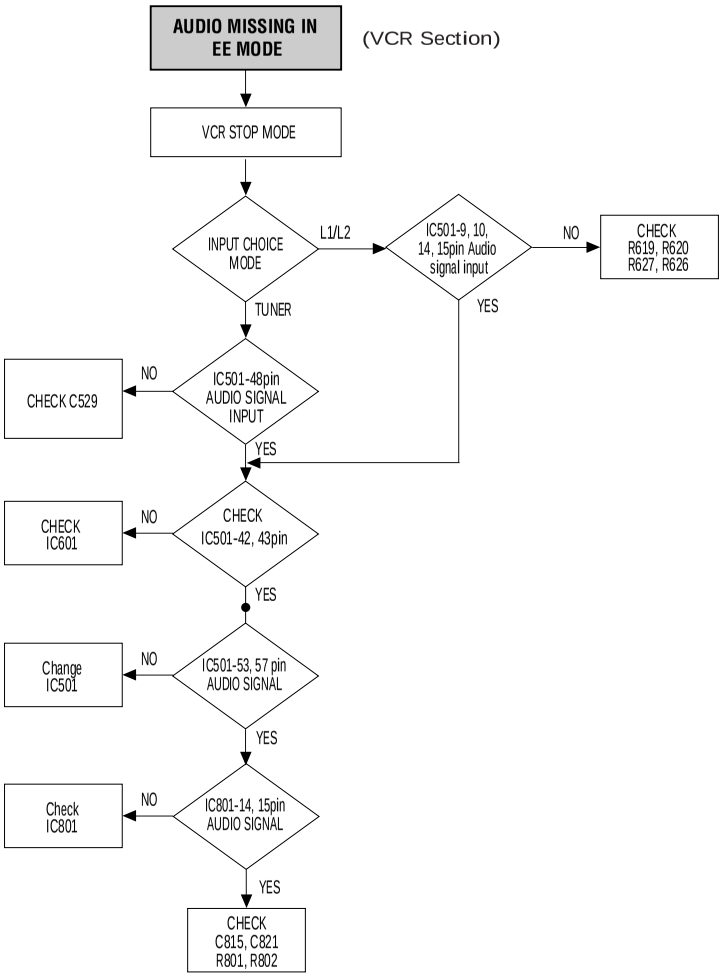

COLOR MISSING IN PLAY MODE
(VCR Section)
NOTE: XT301 - Always (3.579545MHz)
FM-ENV IC301-14
NO
SEE PAGE 7-6 (VIDEO MISSING IN PLAY MODE)
YES
COLOR-MONITOR IC301-46
NO
COLOR-KILLER IC301-"6"(2V)
YES
NO
SW 30HZ IC301-57
NO
CHECK IC601
YES
CHECK IC301-48, 51 XT301
YES
CHANGE IC301
CHECK IC301-26

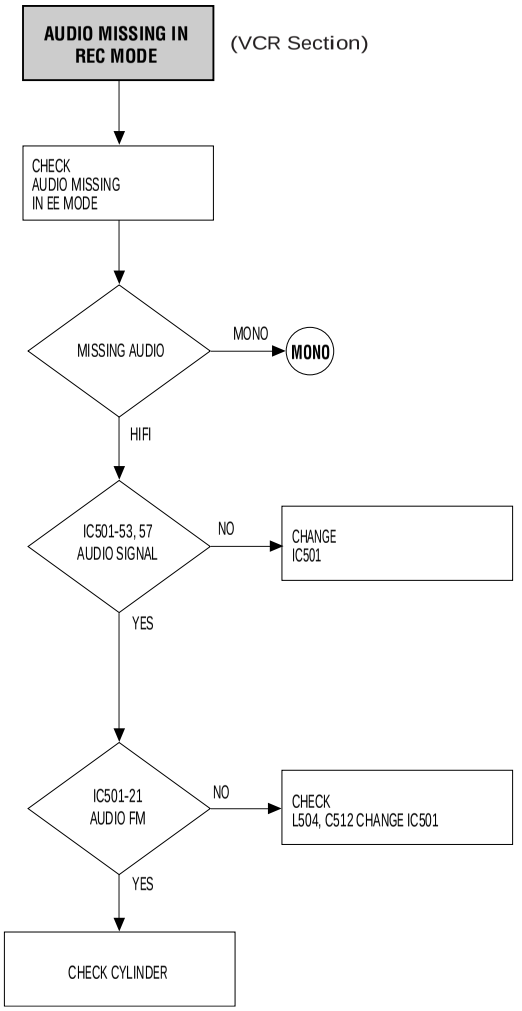
OSD PICTURE MISSING (VCR Section)

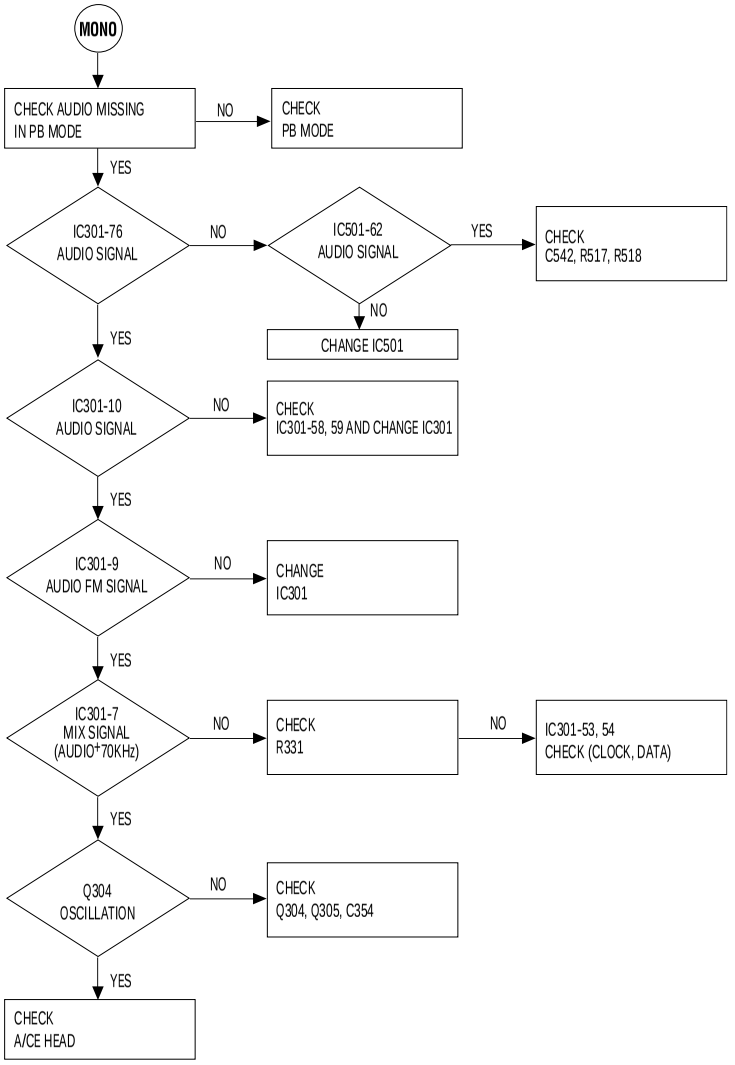


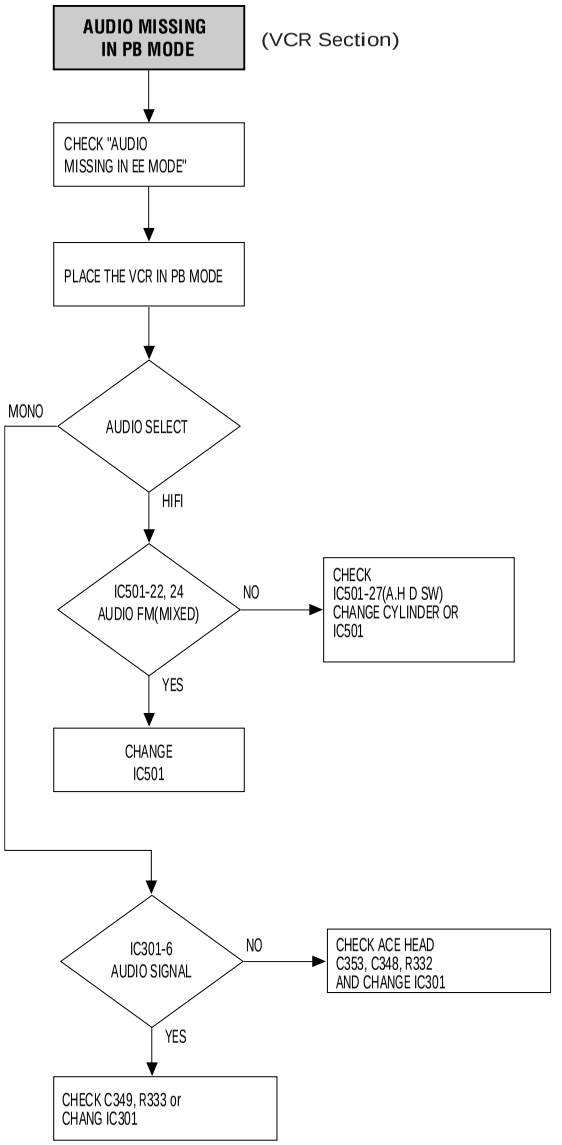
BLUE MISSING IN STOP MODE (VCR Section)

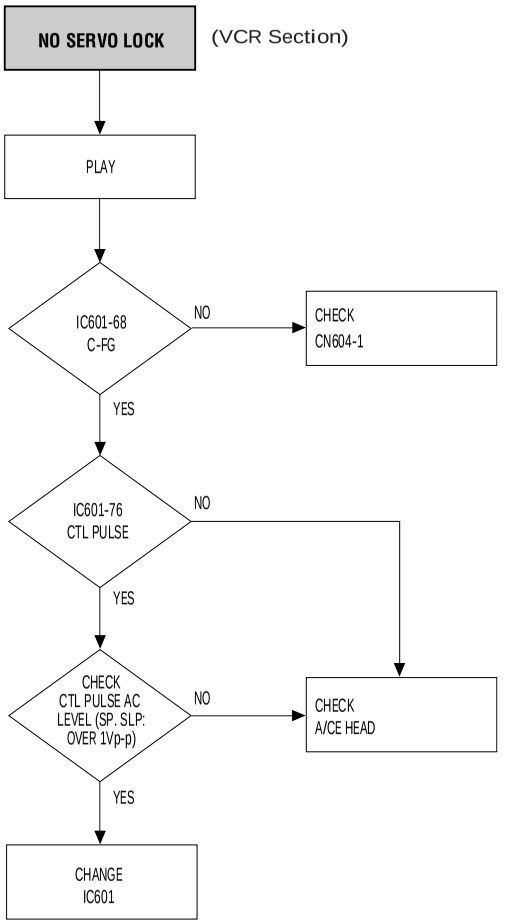


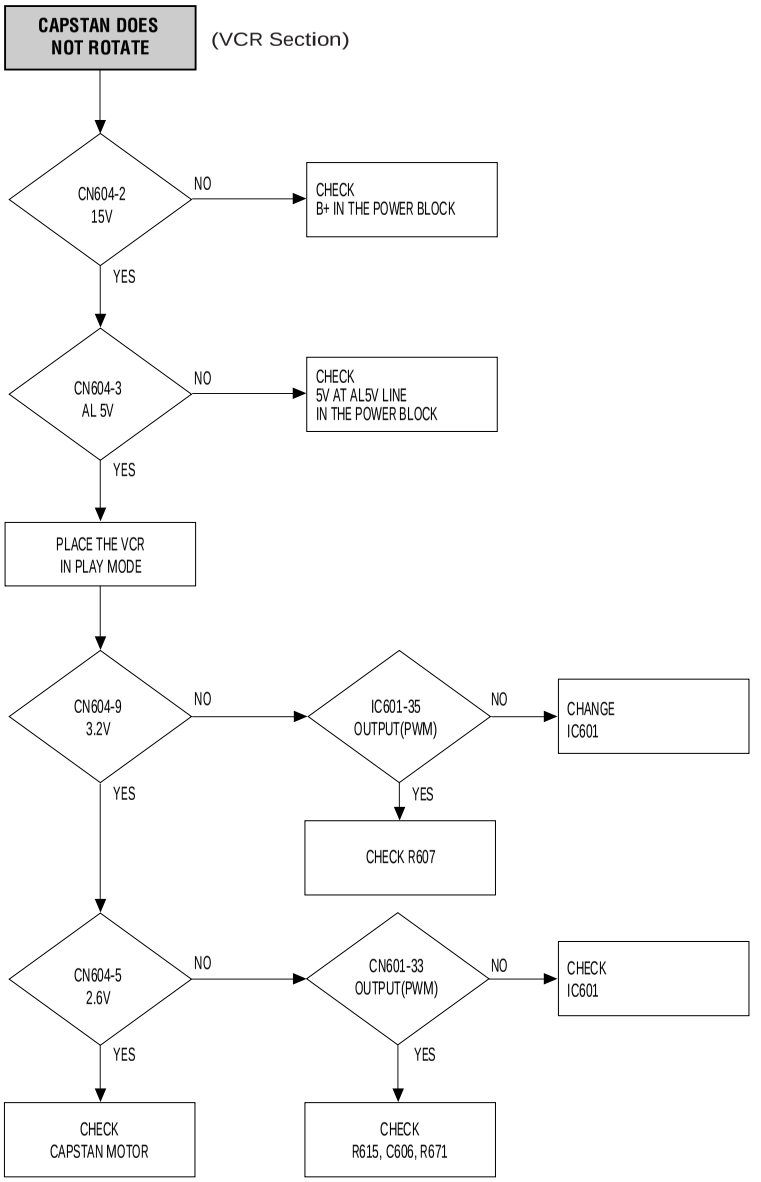

AUDIO MISSING IN EE MODE
(VCR Section)
VCR STOP MODE
INPUT CHOICE MODE
L1/L2
IC501-9, 10, 14, 15pin Audio signal input
NO
CHECK R619, R620 R627, R626
YES
TUNER
CHECK C529
NO
IC501-48pin AUDIO SIGNAL INPUT
YES
CHECK IC601
NO
CHECK IC501-42, 43pin
YES
Change IC501
NO
IC501-53, 57 pin AUDIO SIGNAL
YES
Check IC801
NO
IC801-14, 15pin AUDIO SIGNAL
YES
CHECK C815, C821 R801, R802

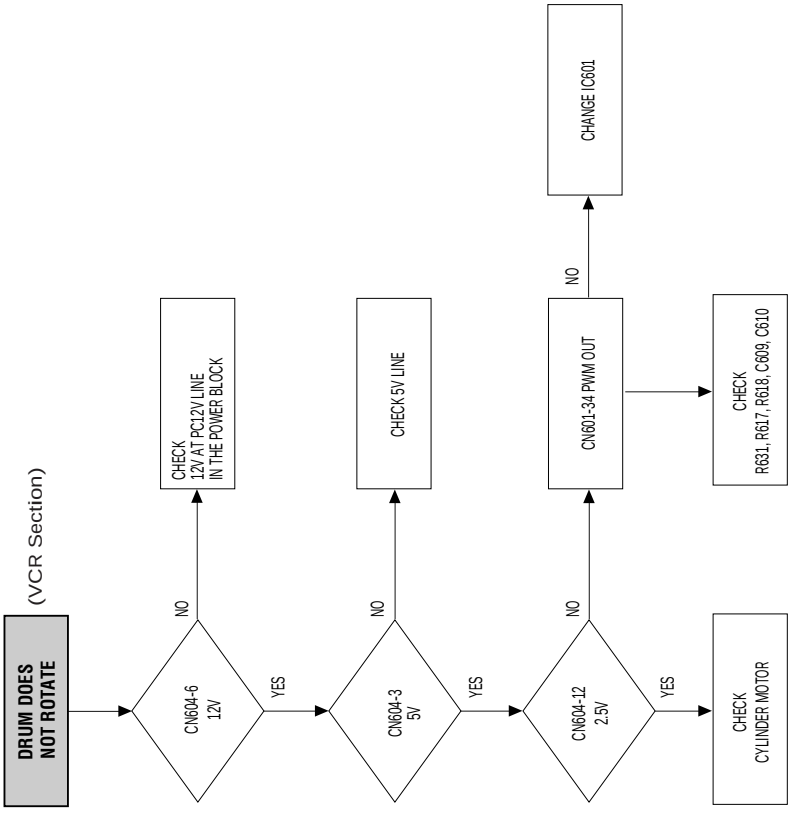

AUDIO MISSING IN REC MODE
(VCR Section)
CHECK AUDIO MISSING IN EE MODE
MISSING AUDIO
MONO
MONO
HIFI
IC501-53, 57 AUDIO SIGNAL
NO
CHANGE IC501
YES
IC501-21 AUDIO FM
NO
CHECK L504, C512 CHANGE IC501
YES
CHECK CYLINDER

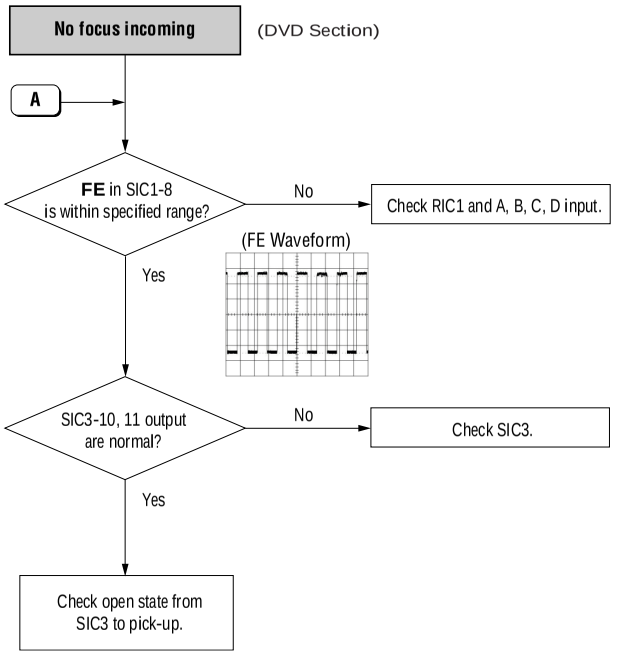

MONO
CHECK AUDIO MISSING IN PB MODE
NO
CHECK PB MODE
YES
IC301-76 AUDIO SIGNAL
NO
IC501-62 AUDIO SIGNAL
YES
CHECK C542, R517, R518
NO
CHANGE IC501
YES
IC301-10 AUDIO SIGNAL
NO
CHECK IC301-58, 59 AND CHANGE IC301
YES
IC301-9 AUDIO FM SIGNAL
NO
CHANGE IC301
YES
IC301-7 MIX SIGNAL (AUDIO+70KHz)
NO
CHECK R331
NO
IC301-53, 54 CHECK (CLOCK, DATA)
YES
Q304 OSCILLATION
NO
CHECK Q304, Q305, C354
YES
CHECK A/CE HEAD

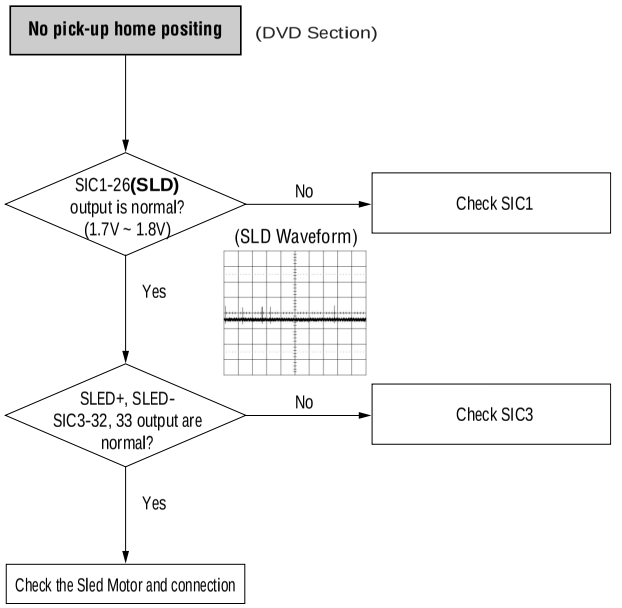

AUDIO MISSING IN PB MODE
(VCR Section)
CHECK "AUDIO MISSING IN EE MODE"
PLACE THE VCR IN PB MODE
MONO
AUDIO SELECT
HIFI
IC501-22, 24 AUDIO FM(MIXED)
NO
CHECK IC501-27(A.H D SW) CHANGE CYLINDER OR IC501
YES
CHANGE IC501
IC301-6 AUDIO SIGNAL
NO
CHECK ACE HEAD C353, C348, R332 AND CHANGE IC301
YES
CHECK C349, R333 or CHANG IC301

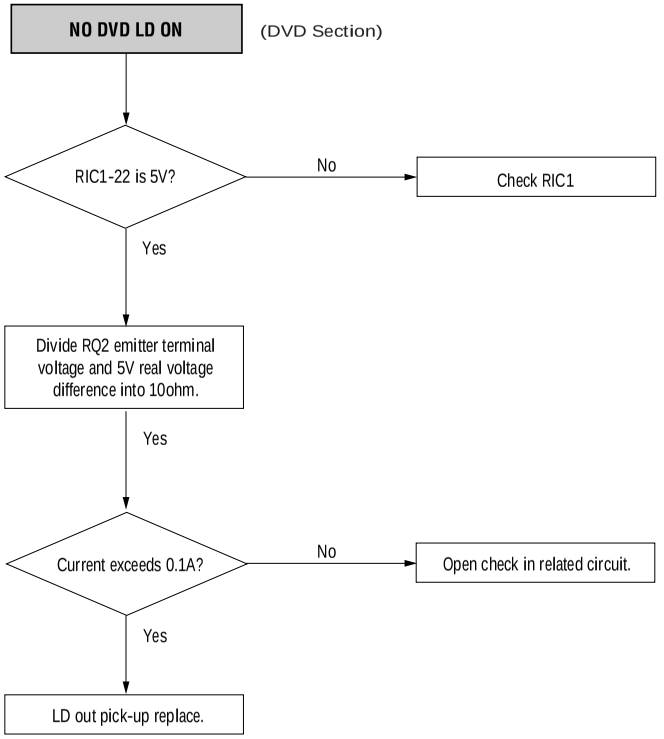

NO SERVO LOCK
(VCR Section)
PLAY
IC601-68
C-FG
NO
CHECK
CN604-1
YES
IC601-76
CTL PULSE
NO
YES
CHECK
CTL PULSE AC
LEVEL (SP. SLP:
OVER 1Vp-p)
NO
CHECK
A/CE HEAD
YES
CHANGE
IC601

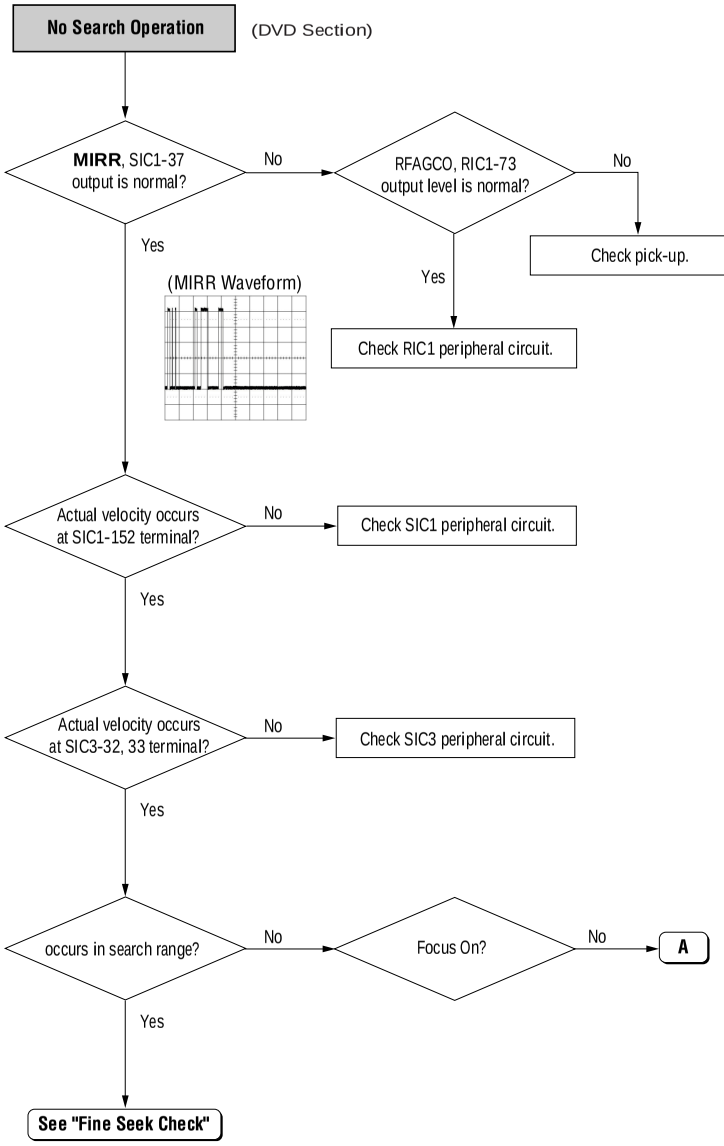

CAPSTAN DOES
NOT ROTATE
(VCR Section)
CN604-2
15V
NO
CHECK
B+ IN THE POWER BLOCK
YES
CN604-3
AL 5V
NO
CHECK
5V AT AL5V LINE
IN THE POWER BLOCK
YES
PLACE THE VCR
IN PLAY MODE
CN604-9
3.2V
NO
IC601-35
OUTPUT(PWM)
NO
CHANGE
IC601
YES
YES
CHECK R607
CN604-5
2.6V
NO
CN601-33
OUTPUT(PWM)
NO
CHECK
IC601
YES
YES
CHECK
CAPSTAN MOTOR
CHECK
R615, C606, R671

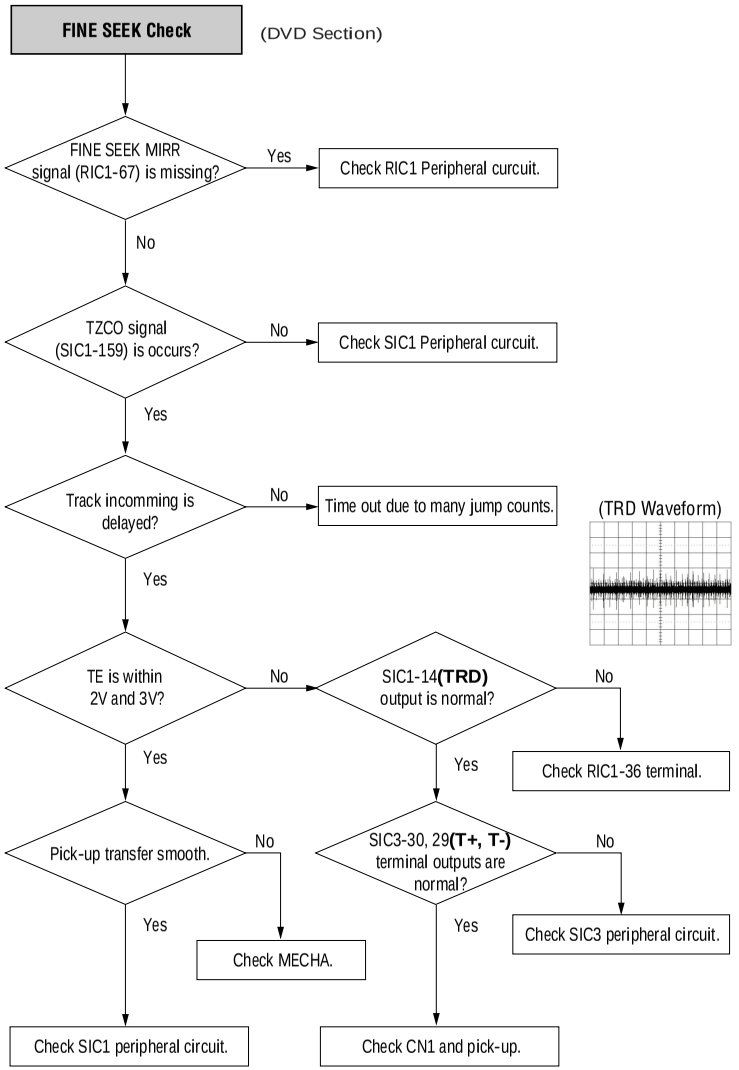

DRUM DOES NOT ROTATE
(VCR Section)
CN604-6 12V
NO
CHECK 12V AT PC12V LINE IN THE POWER BLOCK
YES
CN604-3 5V
NO
CHECK 5V LINE
YES
CN604-12 2.5V
NO
CN601-34 PWM OUT
NO
CHANGE IC601
YES
CHECK CYLINDER MOTOR
CHECK R631, R617, R618, C609, C610

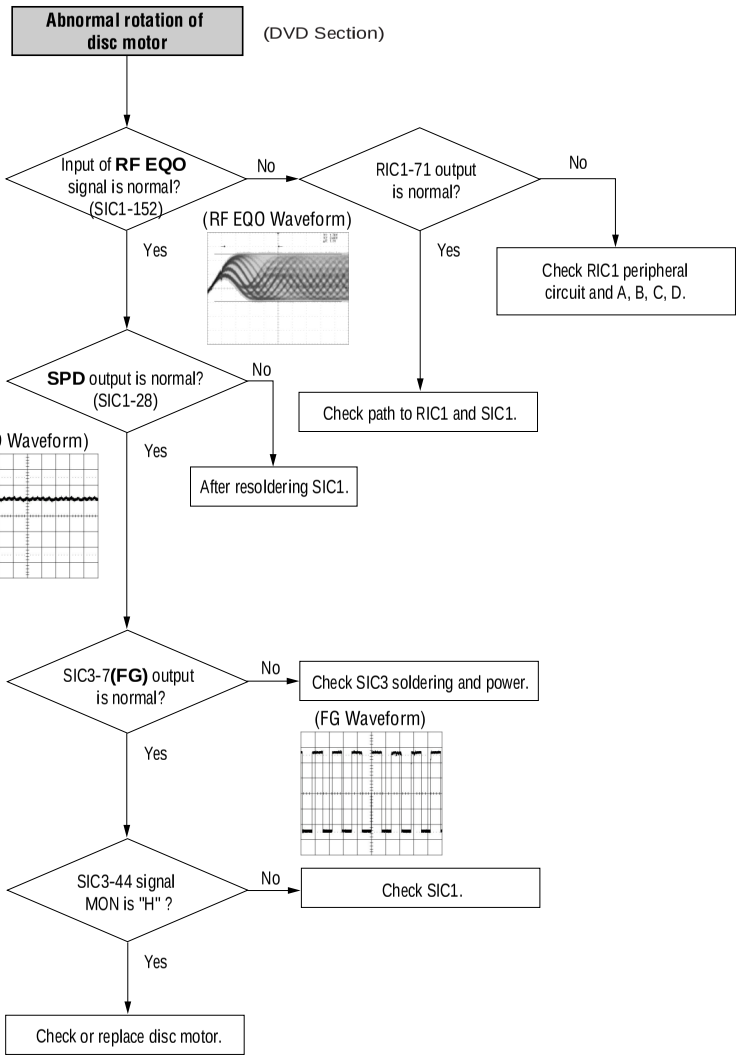

No focus incoming
(DVD Section)
A
FE in SIC1-8 is within specified range?
No
Check RIC1 and A, B, C, D input.
(FE Waveform)
Yes
SIC3-10, 11 output are normal?
No
Check SIC3.
Yes
Check open state from SIC3 to pick-up.

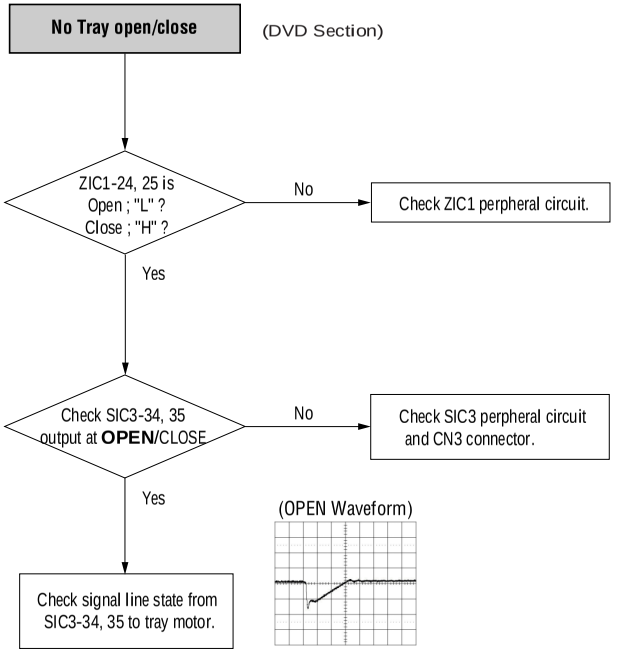

No pick-up home positing
(DVD Section)
SIC1-26(SLD) output is normal? (1.7V ~ 1.8V)
No
Check SIC1
(SLD Waveform)
Yes
SLED+, SLED- SIC3-32, 33 output are normal?
No
Check SIC3
Yes
Check the Sled Motor and connection

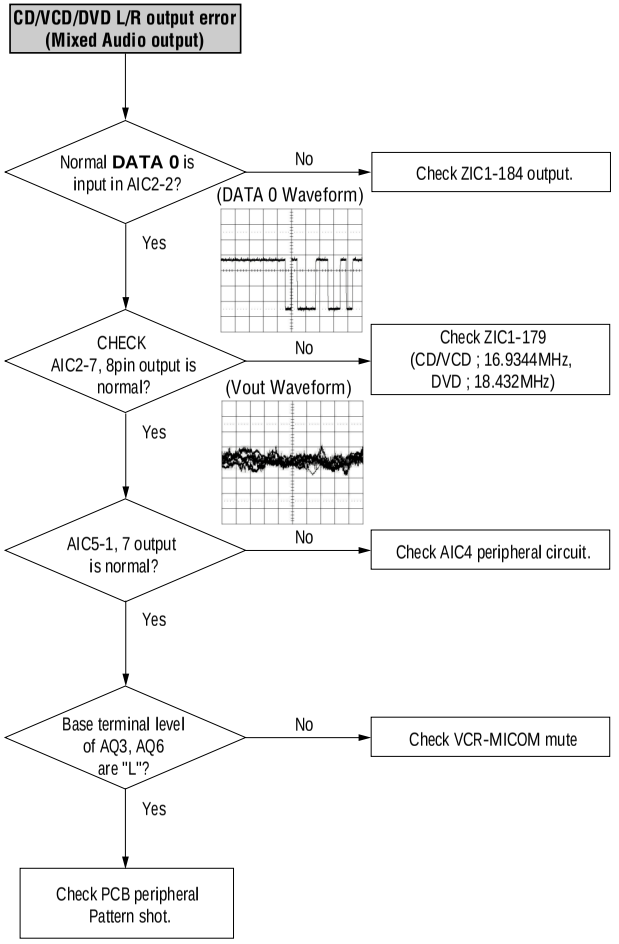

NO DVD LD ON
(DVD Section)
RIC1-22 is 5V?
No
Check RIC1
Yes
Divide RQ2 emitter terminal voltage and 5V real voltage difference into 10ohm.
Yes
Current exceeds 0.1A?
No
Open check in related circuit.
Yes
LD out pick-up replace.

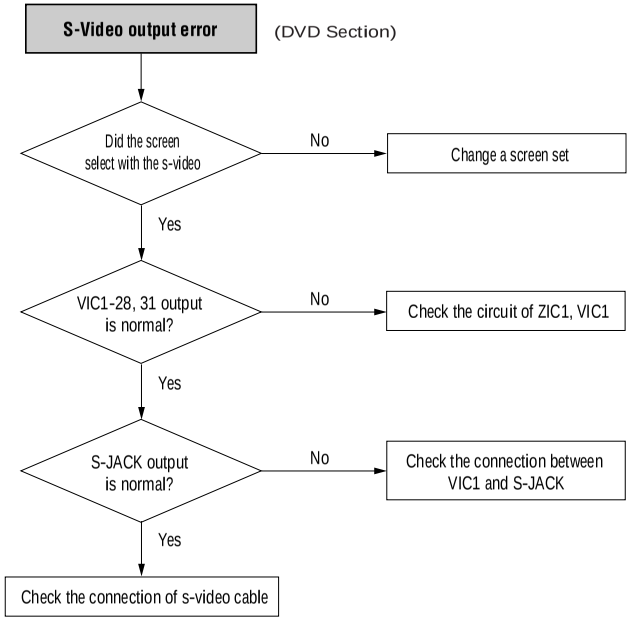

No Search Operation
(DVD Section)
MIRR, SIC1-37 output is normal?
No
RFAGCO, RIC1-73 output level is normal?
No
Check pick-up.
Yes
(MIRR Waveform)
Yes
Check RIC1 peripheral circuit.
Yes
Actual velocity occurs at SIC1-152 terminal?
No
Check SIC1 peripheral circuit.
Yes
Actual velocity occurs at SIC3-32, 33 terminal?
No
Check SIC3 peripheral circuit.
Yes
occurs in search range?
No
Focus On?
No
A
Yes
See "Fine Seek Check"

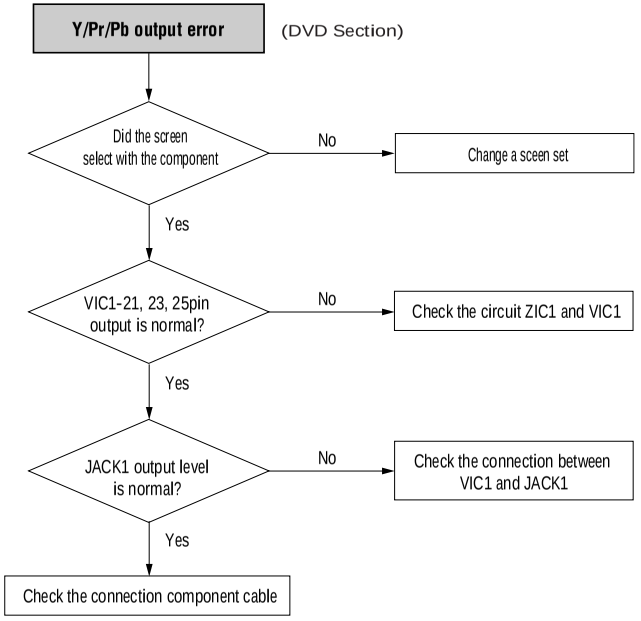

FINE SEEK Check
(DVD Section)
FINE SEEK MIRR signal (RIC1-67) is missing?
Yes
Check RIC1 Peripheral curcuit.
No
TZCO signal (SIC1-159) is occurs?
No
Check SIC1 Peripheral curcuit.
Yes
Track incomming is delayed?
No
Time out due to many jump counts.
(TRD Waveform)
Yes
TE is within 2V and 3V?
No
SIC1-14(TRD) output is normal?
No
Check RIC1-36 terminal.
Yes
Yes
Pick-up transfer smooth.
No
SIC3-30, 29(T+, T-) terminal outputs are normal?
No
Check SIC3 peripheral circuit.
Yes
Yes
Check MECHA.
Check SIC1 peripheral circuit.
Check CN1 and pick-up.

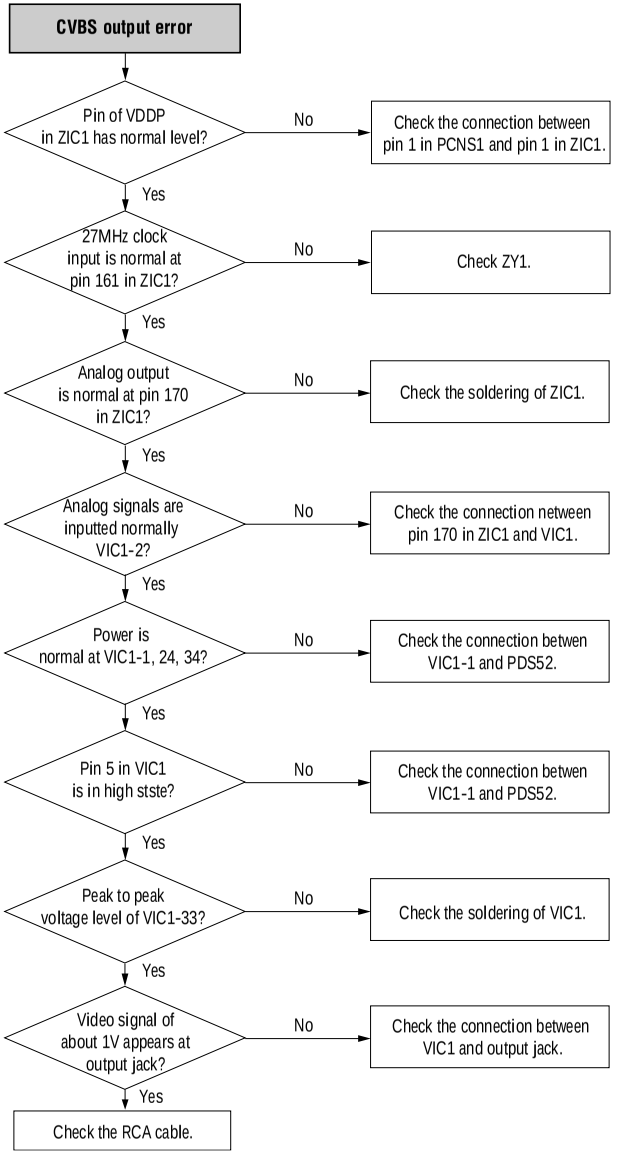

Abnormal rotation of disc motor
(DVD Section)
Input of RF EQO signal is normal? (SIC1-152)
No
RIC1-71 output is normal?
No
(RF EQO Waveform)
Yes
Yes
Check RIC1 peripheral circuit and A, B, C, D.
SPD output is normal? (SIC1-28)
No
Check path to RIC1 and SIC1.
(SPD Waveform)
Yes
After resoldering SIC1.
SIC3-7(FG) output is normal?
No
Check SIC3 soldering and power.
(FG Waveform)
Yes
SIC3-44 signal MON is "H" ?
No
Check SIC1.
Yes
Check or replace disc motor.


No Tray open/close
(DVD Section)
ZIC1-24, 25 is Open ; "L" ? Close ; "H" ?
No
Check ZIC1 perpheral circuit.
Yes
Check SIC3-34, 35 output at OPEN/CLOSE
No
Check SIC3 perpheral circuit and CN3 connector.
Yes
(OPEN Waveform)
Check signal line state from SIC3-34, 35 to tray motor.


CD/VCD/DVD L/R output error (Mixed Audio output)
Normal DATA 0 is input in AIC2-2?
No
Check ZIC1-184 output.
(DATA 0 Waveform)
Yes
CHECK AIC2-7, 8pin output is normal?
No
Check ZIC1-179 (CD/VCD ; 16.9344MHz, DVD ; 18.432MHz)
(Vout Waveform)
Yes
AIC5-1, 7 output is normal?
No
Check AIC4 peripheral circuit.
Yes
Base terminal level of AQ3, AQ6 are "L"?
No
Check VCR-MICOM mute
Yes
Check PCB peripheral Pattern shot.


S-Video output error
(DVD Section)
Did the screen select with the s-video
No
Change a screen set
Yes
VIC1-28, 31 output is normal?
No
Check the circuit of ZIC1, VIC1
Yes
S-JACK output is normal?
No
Check the connection between VIC1 and S-JACK
Yes
Check the connection of s-video cable


Y/Pr/Pb output error
(DVD Section)
Did the screen select with the component
No
Change a sceen set
Yes
VIC1-21, 23, 25pin output is normal?
No
Check the circuit ZIC1 and VIC1
Yes
JACK1 output level is normal?
No
Check the connection between VIC1 and JACK1
Yes
Check the connection component cable


CVBS output error
Pin of VDDP in ZIC1 has normal level?
No
Check the connection between pin 1 in PCNS1 and pin 1 in ZIC1.
Yes
27MHz clock input is normal at pin 161 in ZIC1?
No
Check ZY1.
Yes
Analog output is normal at pin 170 in ZIC1?
No
Check the soldering of ZIC1.
Yes
Analog signals are inputted normally VIC1-2?
No
Check the connection netween pin 170 in ZIC1 and VIC1.
Yes
Power is normal at VIC1-1, 24, 34?
No
Check the connection betwen VIC1-1 and PDS52.
Yes
Pin 5 in VIC1 is in high stste?
No
Check the connection betwen VIC1-1 and PDS52.
Yes
Peak to peak voltage level of VIC1-33?
No
Check the soldering of VIC1.
Yes
Video signal of about 1V appears at output jack?
No
Check the connection between VIC1 and output jack.
Yes
Check the RCA cable.

8. REPAIR PARTS LIST

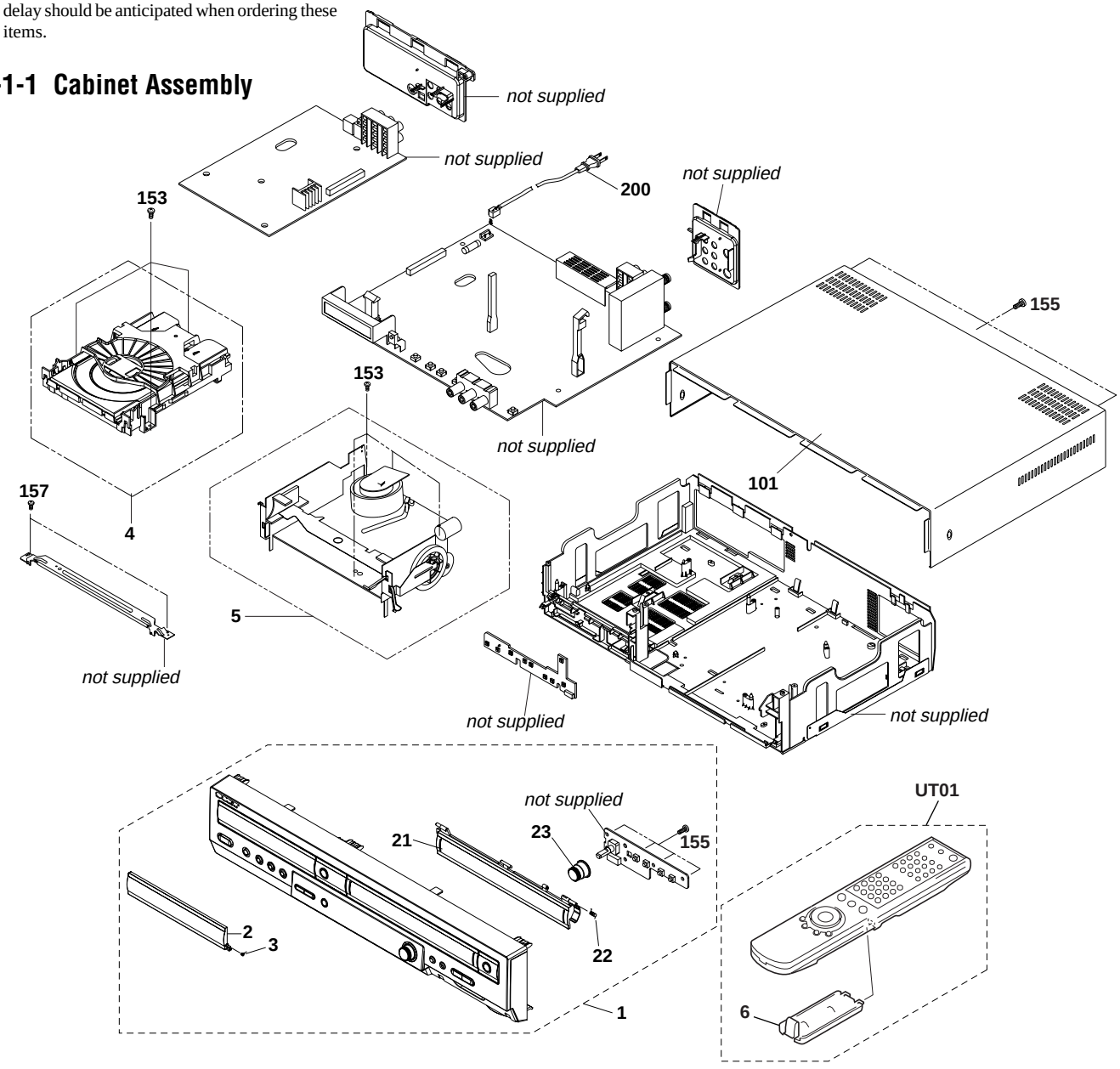
8-1 Exploded Views - - -

8-1 EXPLODED VIEWS

NOTE:
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

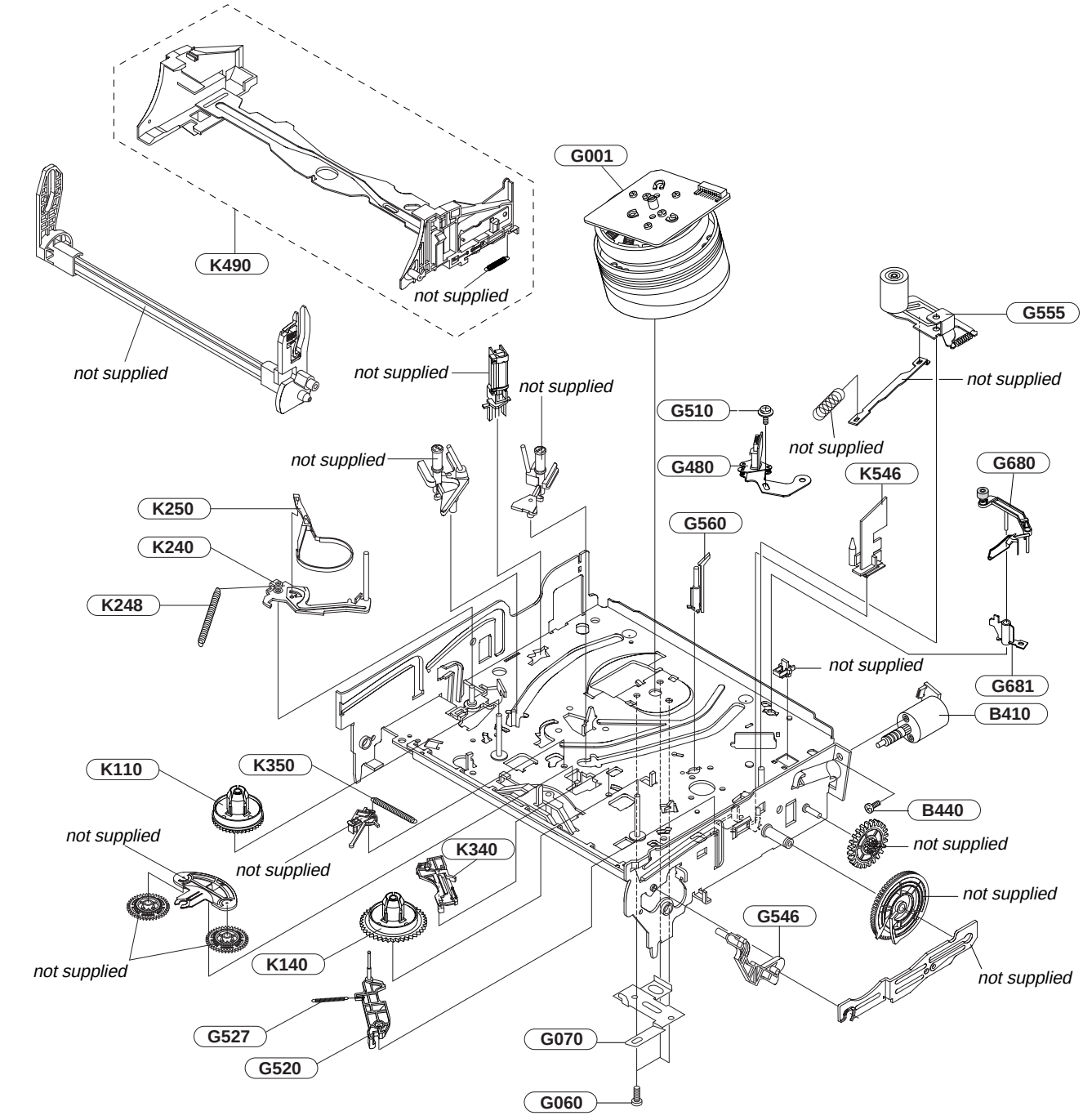
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

8-1-1 Cabinet Assembly



Ref. No.	Part No.	Description	Remarks
1	9-885-037-95	ASSY PANEL FRONT (COMBO D500PU)	
2	9-885-037-27	DOOR TRAY	
3	9-885-037-28	SPRING ETC-DOOR TRAY	
4	9-885-037-38	ASSY DVD DECK	
5	3-084-083-01	ASSY DECK	
6	3-078-598-01	BATTERY COVER (COMBO GRAY)	(for RMT-V501B)
21	9-885-037-26	DOOR CASSETTE	
22	9-885-037-13	SPRING ETC MASK	
23	1-786-352-11	SW-DIAL TIMER	
101	9-885-037-25	CASE (COMBO UC), UPPER	
153	3-075-256-01	SCREW TAP 3X12	
155	3-078-566-01	SCREW TAP M3 L10 BLK	
157	3-075-262-01	SCREW BH 4X12	
⚠200	1-824-674-11	POWER CORD EP2 SPT-2	
UT01	9-885-037-92	COMMANDER (RMT-V501B), (TYPE)	

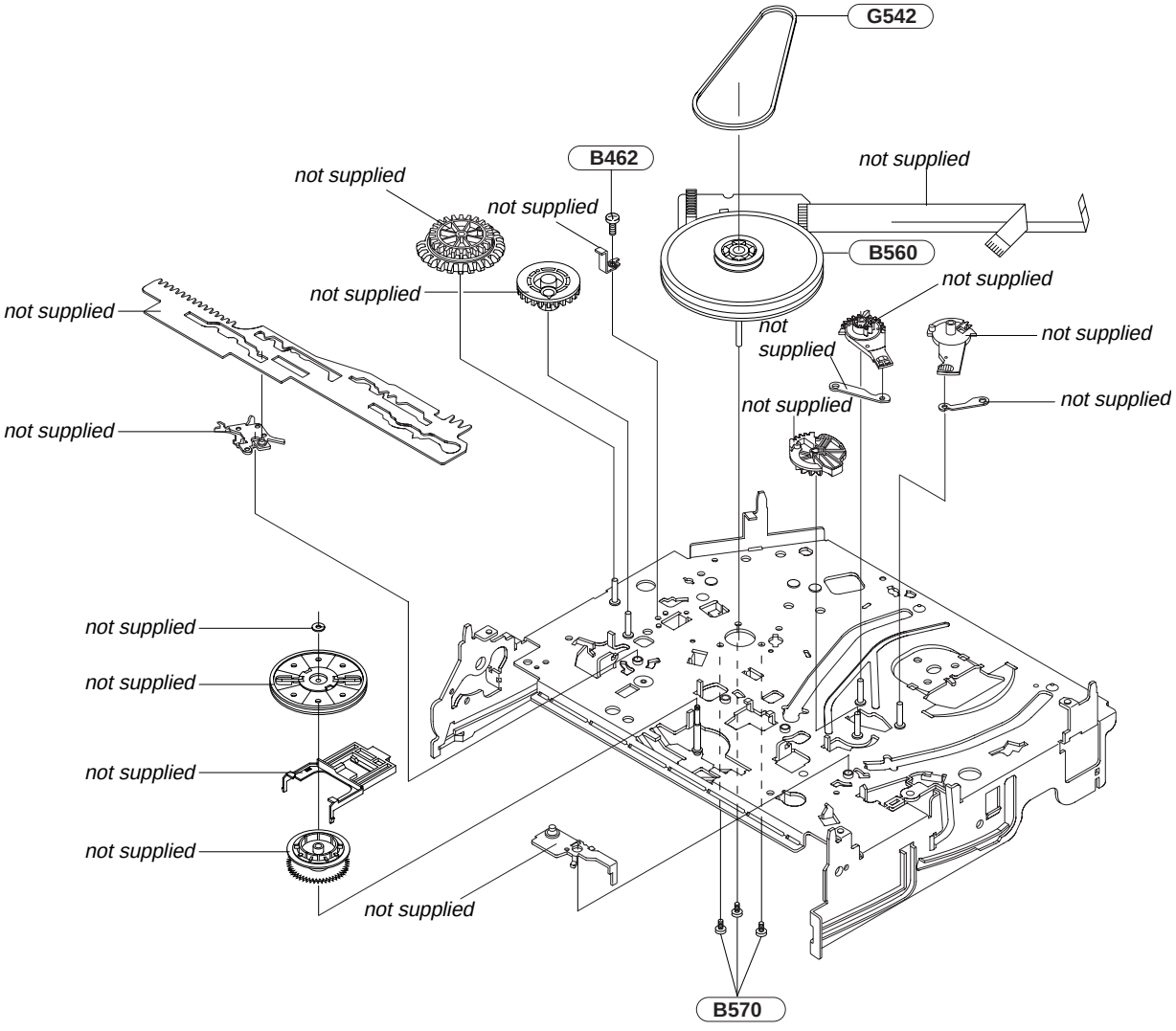
8-1-2 VCR Mechanical Parts (Top Side)



Ref. No.	Part No.	Description	Remarks
B410	1-763-836-11	LOADING ASSY, MOTOR	
B440	3-075-257-01	SCREW TAP 2.6X5	
G001	1-787-013-11	ASSY CLYNDER (NTSC 6HD)	
G060	3-075-254-01	SCREW ASSY MAC 3X6	
G070	3-067-796-01	PLATE-GROUND DECK	
G480	3-075-241-01	ASSY ACE HEAD	
G510	3-084-091-01	SCREW TAP 2.6X5	
G520	3-067-779-01	LEVER-#9 GUIDE	
G527	3-067-780-01	SPRING-#9 GUIDE	
G546	3-067-787-01	LEVER-FL DOOR	
G555	3-067-784-01	LEVER-UNIT PINCH	
G560	3-079-356-01	POST-#8 GUIDE ASSY	

Ref. No.	Part No.	Description	Remarks
G680	3-075-021-01	AUTO HEAD CLEANER (G680)	
G681	3-075-022-01	AUTO HEAD CLEANER (G681)	
K110	3-075-047-01	DISK S REEL	
K140	3-075-046-01	DISK T REEL	
K240	3-067-781-01	LEVER-TENSION	
K248	3-067-782-01	SPRING-TENSION LEVER	
K250	3-067-783-01	BAND-BREAK	
K340	3-067-785-01	LEVER-T. BRAKE	
K350	3-067-786-01	SPRING-BRAKE	
K490	3-067-788-01	HOLDER-FL CASS.	
K546	3-067-789-01	GUIDE-CASS. DOOR	

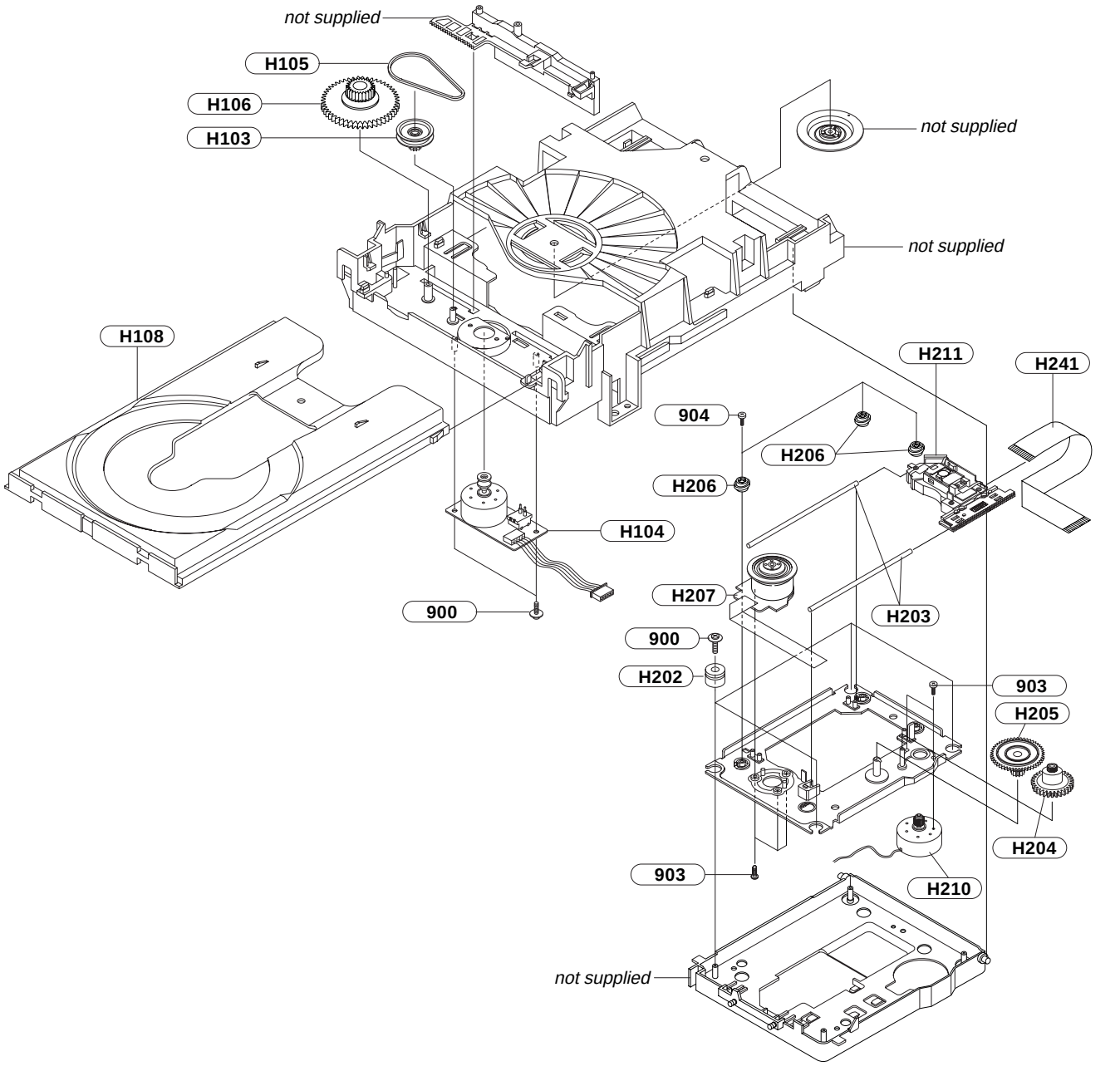
8-1-3 VCR Mechanical Parts (Bottom Side)



Ref. No.	Part No.	Description	Remarks
B462	3-075-260-01	SCREW MAC 3X3	
B560	1-796-432-11	MOTOR CAPSTAN	

Ref. No.	Part No.	Description	Remarks
B570	3-075-259-01	SCREW CAP 2.6X6	
G542	3-067-790-01	BELT-PULLEY	

8-1-4 DVD Mechanical Parts



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remarks
900	3-078-592-01	SCREW TAP 2X6	
903	9-885-037-07	SCREW MAC 1.7X3	
904	9-885-037-08	SCREW TAP 1.7X5	
H103	9-885-037-29	PULLEY GEAR	
H104	9-885-037-20	MOTOR LOADING ASSY	
H105	3-078-583-01	BELT RECTANGULAR	
H106	9-885-037-30	GEAR TRAY	
H108	9-885-037-24	TRAY DISC	
H202	9-885-037-35	RUBBER INSULATOR	

Ref. No.	Part No.	Description	Remarks
H203	3-078-588-01	SHAFT PU	
H204	9-885-037-31	GEAR FEED A	
H205	9-885-037-32	GEAR FEED B	
H206	9-885-037-23	HOLDER-CAM SKEW	
H207	9-885-037-21	MOTOR-SPINDLE	
H210	9-885-037-22	MOTOR FEED ASSY	
⚠H211	9-885-037-37	ASSY PICK UP	
H241	9-885-037-06	CABLE FLAT 24P	

DVD MAIN **VCR MAIN**

8-2 ELECTRICAL PARTS LIST

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- Not all of the parts are listed.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA... , uPA... , μPA... ,
  uPB... , μPB... , uPC... , μPC... ,
  uPD..., μPD...
- CAPACITORS:
  uF: μF
- COILS
  uH: μH

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remarks
		DVD MAIN BOARD	
		**********	
	9-885-037-94	PWB MAIN ASSY	
SC3A	3-075-255-01	SCREW TAP 3X8	
		< DIODE >	
AD1	1-805-012-11	DIODE DAN202K	
AD2	1-805-012-11	DIODE DAN202K	
AD3	1-805-012-11	DIODE DAN202K	
AD4	1-805-009-11	DIODE DAN217	
AD5	1-805-012-11	DIODE DAN202K	
AZ1	1-805-011-11	DIODE UDZ9.1B	
AZ2	1-805-011-11	DIODE UDZ9.1B	
AZ3	1-805-011-11	DIODE UDZ9.1B	
AZ4	1-805-011-11	DIODE UDZ9.1B	
DD1	1-805-013-11	DIODE DAP202K	
DOZ1	1-805-011-11	DIODE UDZ9.1B	
DOZ2	1-805-011-11	DIODE UDZ9.1B	
VZ1	1-805-011-11	DIODE UDZ9.1B	
VZ2	1-805-011-11	DIODE UDZ9.1B	
VZ3	1-805-011-11	DIODE UDZ9.1B	
VZ4	1-805-011-11	DIODE UDZ9.1B	
VZ5	1-805-011-11	DIODE UDZ9.1B	
VZ6	1-805-011-11	DIODE UDZ9.1B	
VZ7	1-805-011-11	DIODE UDZ9.1B	
VZ8	1-805-011-11	DIODE UDZ9.1B	
VZ9	1-805-011-11	DIODE UDZ9.1B	
VZ10	1-805-011-11	DIODE UDZ9.1B	
		< IC >	
AIC2	1-805-024-11	IC (DA CONVERTER)	
AIC4	1-805-028-11	IC 4560 (OP AMP)	
AIC5	1-805-028-11	IC 4560 (OP AMP)	
DIC1	1-805-039-11	IC M74HCU04	
PIC1	1-805-030-11	IC 1563 (V REGULATOR)	
PIC2	9-885-037-02	IC (POSI.FIXED)	
PIC3	1-805-031-11	IC 3RD13 (V REGULATOR)	
RIC1	9-885-037-19	IC S5L1463A01 (ASIC)	
SIC1	9-885-037-18	IC S5L1455X01 (ASIC)	
SIC2	9-885-036-98	IC 41LV16256 (DRAM)	
SIC3	9-885-036-97	IC FAN8728 (MOTOR DRIVER)	
VIC1	9-885-037-86	IC LA73054 (VIDEO)	
ZIC1	9-885-037-04	IC ZR36748 (DECODER)	
ZIC2	9-885-036-99	IC IS42S16400A-7T (DRAM)	
ZIC3	9-885-037-00	IC (FLASH MEMORY)	
ZIC7	1-805-027-11	IC 24C021 (EEPROM)	
ZIC8	1-805-022-11	IC 74VHCT125A (CMOS LOGIC)	
		< COIL >	
AL1	1-400-316-11	INDUCTOR 0uH	
AL2	1-400-316-11	INDUCTOR 0uH	
AL3	1-400-316-11	INDUCTOR 0uH	
AL4	1-400-316-11	INDUCTOR 0uH	
		< TRANSISTOR >	
AQ1	1-805-017-11	TRANSISTOR 200MW	
AQ2	1-805-018-11	TRANSISTOR KSR2103	
AQ3	1-805-016-11	TRANSISTOR KSC1623-L	
AQ4	1-805-017-11	TRANSISTOR 200MW	
AQ5	1-805-018-11	TRANSISTOR KSR2103	
AQ6	1-805-016-11	TRANSISTOR KSC1623-L	
AQ7	1-805-017-11	TRANSISTOR 200MW	
AQ8	1-805-018-11	TRANSISTOR KSR2103	
AQ9	1-805-015-11	TRANSISTOR KSA812	
DQ1	1-805-016-11	TRANSISTOR KSC1623-L	
DQ2	1-805-016-11	TRANSISTOR KSC1623-L	
DQ3	1-805-016-11	TRANSISTOR KSC1623-L	
RQ1	1-805-014-11	TRANSISTOR KSA1182-Y	
RQ2	1-805-014-11	TRANSISTOR KSA1182-Y	
		< VIBRATOR >	
SY1	1-795-749-11	CRYSTAL UNIT (33.8688MHz)	
ZY1	1-795-750-11	CRYSTAL UNIT (27MHz)	
		VCR MAIN BOARD	
		**********	
FC1S01	1-576-527-11	FUSE CLIP	
FC1S02	1-576-527-11	FUSE CLIP	
LD601A	3-067-777-01	HOLDER-LED	

Ref. No.	Part No.	Description	Remarks
S601A	3-075-066-01	HOLDER-SENSOR	
S602A	3-075-066-01	HOLDER-SENSOR	
		< CAPACITOR >	
⚠C1S04	1-165-573-11	CONDENSER FILM 0.1uF	
⚠C1S05	1-165-573-11	CONDENSER FILM 0.1uF	
C1S06	1-165-557-11	CONDENSER 2200PF	
		< DIODE >	
D301	1-804-416-11	DIODE MTZJ5.1B	
D503	1-804-407-11	DIODE IN4148	
D504	1-804-407-11	DIODE IN4148	
D505	1-804-407-11	DIODE IN4148	
D506	1-804-407-11	DIODE IN4148	
D507	1-804-407-11	DIODE IN4148	
D601	1-804-407-11	DIODE IN4148	
D603	1-804-409-11	DIODE IN4002	
D604	1-804-409-11	DIODE IN4002	
D605	1-804-407-11	DIODE IN4148	
D606	1-804-409-11	DIODE IN4002	
D701	1-804-407-11	DIODE IN4148	
D702	1-804-407-11	DIODE IN4148	
D703	1-804-407-11	DIODE IN4148	
D704	1-804-407-11	DIODE IN4148	
D802	1-804-416-11	DIODE MTZJ5.1B	
D803	1-804-407-11	DIODE IN4148	
D1S01	1-804-413-11	DIODE IT5	
D1S02	1-804-413-11	DIODE IT5	
D1S03	1-804-413-11	DIODE IT5	
D1S04	1-804-413-11	DIODE IT5	
D1S05	1-804-408-11	DIODE UF4007	
D1S06	1-804-407-11	DIODE IN4148	
D1S07	1-804-412-11	DIODE FIT4	
D1P101	1-804-409-11	DIODE IN4002	
D1P102	1-804-409-11	DIODE IN4002	
D1P103	1-804-407-11	DIODE IN4148	
D1P105	1-804-407-11	DIODE IN4148	
D1P107	1-804-407-11	DIODE IN4148	
D1P108	1-804-407-11	DIODE IN4148	
D1SS05	1-805-041-11	DIODE SE55	
D1SS07	1-805-041-11	DIODE SE55	
D1SS08	1-805-041-11	DIODE SE55	
D1SS09	1-804-412-11	DIODE FIT4	
D1SS12	1-804-412-11	DIODE FIT4	
D1SS13	1-804-411-11	DIODE UG2D	
D1SS15	1-804-412-11	DIODE FIT4	
D1SS18	1-804-412-11	DIODE FIT4	
ZD401	1-804-414-11	DIODE UZP33B	
ZD1P02	1-804-418-11	DIODE MTZJ12B	
ZD1P04	1-804-416-11	DIODE MTZJ5.1B	
ZD1P05	1-804-418-11	DIODE MTZJ12B	
ZD1P06	1-804-416-11	DIODE MTZJ5.1B	
ZD1S01	1-805-265-11	DIODE MTZJ4.3B	
ZD1S02	9-885-036-94	DIODE MTZJ20B	

Ref. No.	Part No.	Description	Remarks
		< DISPLAY >	
DT701	9-885-037-91	LED DISPLAY LTG-0262M-01	
		< FUSE >	
⚠F1S01	1-576-525-11	FUSE (1.6A/250V)	
		< IC >	
IC301	1-805-296-11	IC LA71207 (VIDEO)	
IC501	1-804-434-11	IC AN3663FBP	
IC601	9-885-037-87	IC MN101DF06ZAF (MICOM)	
IC603	1-805-042-11	IC 524C80D41 (EEPROM)	
IC6B1	1-804-444-11	IC KA7533	
IC701	1-804-706-11	IC (LED DRIVER)	
IC801	9-885-036-96	IC BU4053BCFV (CMOS LOGIC)	
IC1S01	9-885-037-01	IC (PWM CONTROLLER)	
IC1S02	1-804-784-11	PHOTO COUPLER	
IC1SS2	1-804-445-11	IC KA4318	
		< COIL >	
⚠L1S02	1-424-831-11	LINE FILTER 20mH	
		< LED >	
LD601	1-804-438-11	LED-IR (T/S REEL)	
		< TRANSFORMER >	
⚠PT1S01	9-885-037-88	TRANS SWITCHING EE3530	
		< PHOTO INTERRUPTER >	
PT601	1-804-770-11	PHOTO INTERRUPTER (S REEL)	
PT602	1-804-770-11	PHOTO INTERRUPTER (T REEL)	
		< TRANSISTOR >	
Q302	1-804-420-11	TRANSISTOR KSA733	
Q303	1-804-421-11	TRANSISTOR KSC945	
Q304	1-804-420-11	TRANSISTOR KSA733	
Q305	1-804-422-11	TRANSISTOR KTC3023	
Q306	1-804-420-11	TRANSISTOR KSA733	
Q307	1-804-422-11	TRANSISTOR KTC3023	
Q308	1-804-422-11	TRANSISTOR KTC3023	
Q601	1-804-428-11	TRANSISTOR KSR1004	
Q701	1-804-421-11	TRANSISTOR KSC945	
Q801	1-804-421-11	TRANSISTOR KSC945	
Q802	1-804-428-11	TRANSISTOR KSR1004	
Q803	1-804-428-11	TRANSISTOR KSR1004	
Q804	1-804-429-11	TRANSISTOR KSR2001	
Q805	1-804-421-11	TRANSISTOR KSC945	
Q806	1-804-421-11	TRANSISTOR KSC945	
Q807	1-804-421-11	TRANSISTOR KSC945	
Q808	1-804-421-11	TRANSISTOR KSC945	
Q1S01	9-885-036-95	TRANSISTOR (FET SILICON)	
Q1P101	1-804-424-11	TRANSISTOR KSC2328AY	

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

VCR MAIN

Ref. No.	Part No.	Description	Remarks
Q1P102	1-804-429-11	TRANSISTOR KSR2001	
Q1P103	1-804-421-11	TRANSISTOR KSC945	
Q1P105	1-804-424-11	TRANSISTOR KSC2328AY	
Q1P106	1-804-424-11	TRANSISTOR KSC2328AY	
Q1P107	1-804-424-11	TRANSISTOR KSC2328AY	
Q1P108	1-804-429-11	TRANSISTOR KSR2001	
Q1P109	1-804-421-11	TRANSISTOR KSC945	
Q1P110	1-804-424-11	TRANSISTOR KSC2328AY	
Q1P111	1-804-424-11	TRANSISTOR KSC2328AY	
		< MODULE >	
RM701	1-477-308-11	REMOCON MODULE (TSOP2238WE1)	
		< PHOTO TRANSISTOR >	
S601	1-804-439-11	PHOTO TRANSISTOR (END SENSOR)	
S602	1-804-439-11	PHOTO TRANSISTOR (START SENSOR)	
		< SWITCH >	
SW602	1-786-199-11	SWITCH REC (REC SWITCH)	
SW603	1-786-198-11	SWITCH MODE (PROGRAM SWITCH)	
		< TUNER >	
TM401	1-693-638-11	TUNER NTSC TMZH2002A	
		< VARISTOR >	
VA1S01	1-804-437-11	VARISTOR	
		< VIBRATOR >	
XT301	1-795-333-11	VIBRATOR CRYSTAL (3.579545MHz)	
XT601	1-795-996-11	CRYSTAL UNIT (14.318448MHz)	
		MISCELLANEOUS	
		**********	
⚠200	1-824-674-11	POWER CORD EP2 SPT-2	
B410	1-763-836-11	LOADING ASSY, MOTOR	
B560	1-796-432-11	MOTOR CAPSTAN	
G001	1-787-013-11	ASSY CLYNDER (NTSC 6HD)	
H104	9-885-037-20	MOTOR LOADING ASSY	
H207	9-885-037-21	MOTOR-SPINDLE	
H210	9-885-037-22	MOTOR FEED ASSY	
⚠H211	9-885-037-37	ASSY PICK UP	
H241	9-885-037-06	CABLE FLAT 24P	
		ACCESSORIES & PACKING MATERIALS	
		**********	
	3-078-598-01	BATTERY COVER (COMBO GRAY) (for RMT-V501B)	
	3-083-946-11	MANUAL, INSTRUCTION (ENGLISH)	
	9-885-037-92	COMMANDER (RMT-V501B), (TYPE)	

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

9-929-771-31

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